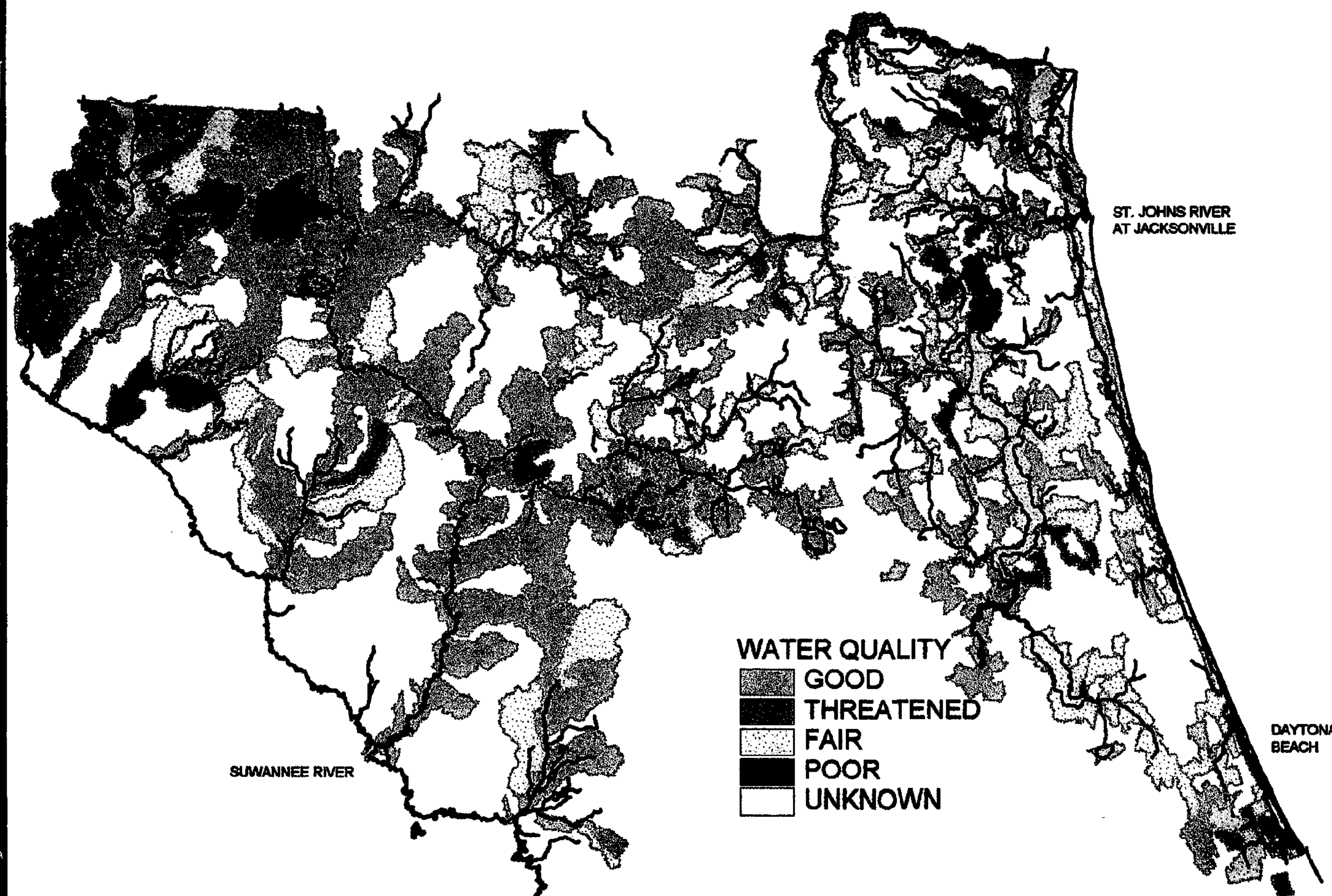
NORTHEAST FLORIDA DISTRICT WATER QUALITY ASSESSMENT
1994 305 (b) TECHNICAL APPENDIX



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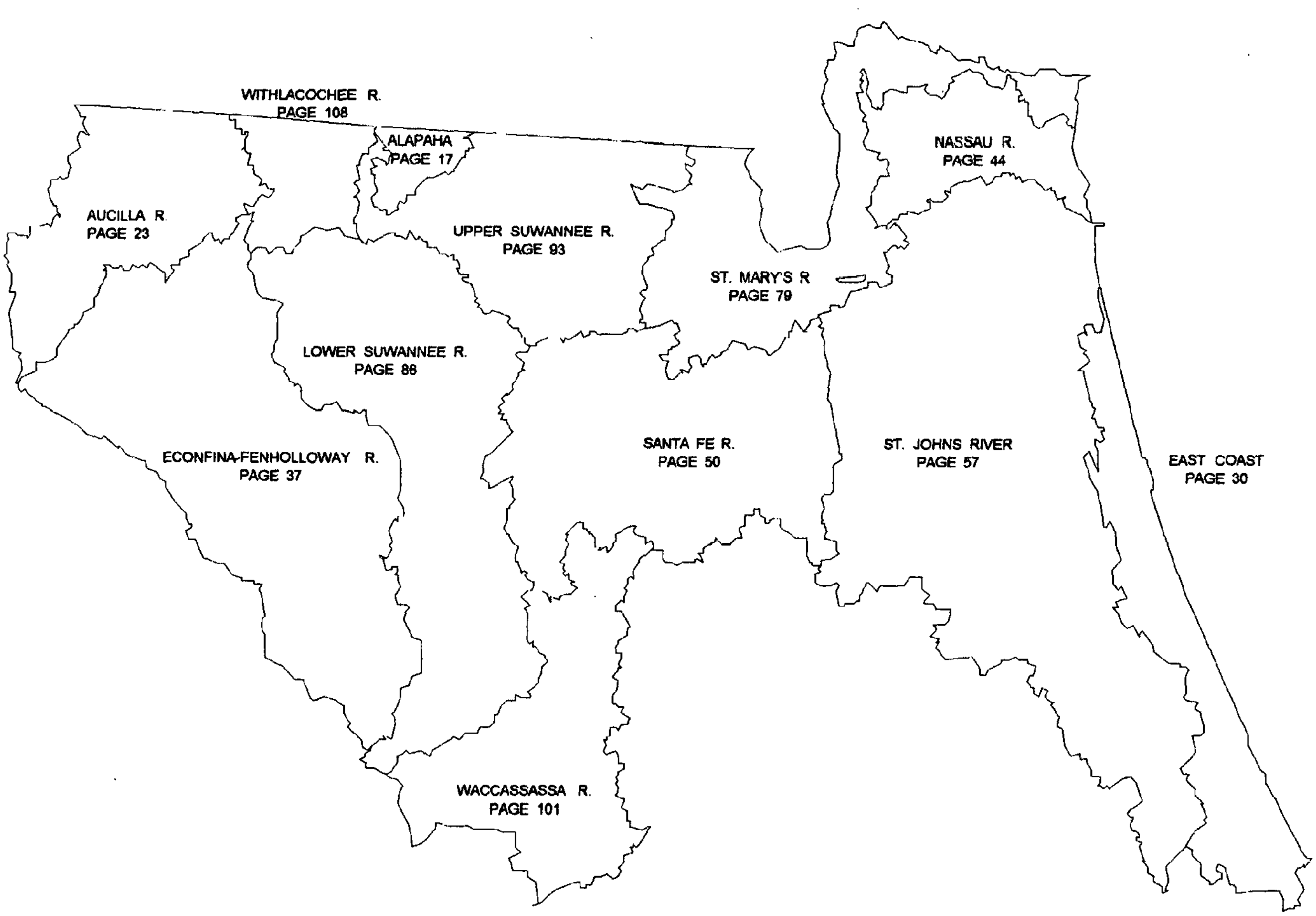
NOVEMBER, 1994

TASK 4.1

INDEX TO RIVER BASINS



1994 WATER QUALITY ASSESSMENT FOR THE STATE OF FLORIDA

TECHNICAL APPENDIX

Submitted in accordance with the Federal Clean Water Act Section 305(b)

November, 1994

Standards and Monitoring Section
Bureau of Surface Water Management
Division Of Water Facilities

TABLE OF CONTENTS

PREFACE

This report is produced to inform Floridians and the EPA about surface water quality conditions and trends in Florida. Originally produced in 1978, this report has been updated every two years since, and has gone through many changes. The items listed below identify the major format changes which distinguish this report from its predecessor.

- **Regional Reports** - The large size of the statewide report (550 pages) necessitated its subdivision into 5 regional reports which correspond roughly with Department of Environmental Protection District Office boundaries (South and Southeast District Office reports are under one cover).
- **Watersheds versus Reaches** - In 1992 the State's rivers, lakes and estuaries were subdivided into 1600 'reaches' and the assessment was based on this reach structure, however much of the State's waters were not contained within the reaches. For 1994, the assessed area has been enlarged to cover the entire State by dividing the State into 4400 watersheds. The original 1600 reaches remain pretty much intact within the new watersheds, and the terminology now includes watershed and waterbody rather than reach.
- **ARC/INFO Water Quality Color Maps** - GIS techniques were used to produce color maps depicting water quality (designated use support) in each river basin. Watersheds were color coded based on good, threatened, fair or poor water quality designations.
- **New Nonpoint Source Qualitative Survey** - A nonpoint source qualitative survey was performed in 1988 and has been updated and included in this report for 1994. The survey used the same watersheds which were used to assess the water quality data and the qualitative results were integrated into this report to both supplement the quantitative information and to provide information when no quantitative information was available.
- **Current versus Historic Data** - Water quality data were examined for two time periods: current data from 1989-1993 and historic data from 1970-1988. Historic data were used to assess waterbodies only when there was no current data available.

ACKNOWLEDGMENTS

We would like to express our gratitude to all of the professionals that supplied us with water quality data and reports, responded to surveys, and answered telephone inquiries concerning the status of waterbodies in their area. The quality of this report has been greatly enhanced by their efforts.

A committee thoroughly reviewed and commented on the 1992 305 (b) report and their comments were incorporated into this report. Individuals in this committee include: Catherine Krestalude, Ernie Frey, Jerry Owen, Lee Banks, Rich Bowman , Jan Brewer, Scott Bulgrun, Teresa Frame, Angela Halfacre, Mike Hollingsworth, Amy Kalmbacher, Tim Mckelvey, Mary Nogas, Lindy Payne, and Jim Wright of the Northeast District; Rob Mattson of the Suwannee River Water Management; District, John Hendrickson of the St. Johns Water Management District: and Betsy Deuerling, Don Roberson, Allan Flood and Margaret Walsh of the City of Jacksonville.

The Nonpoint Source Stormwater Section put in a tremendous amount of work on the 1994 Nonpoint Source Assessment Survey . This team included Kent Cain, Ellen McCarron, and Mike Scheinkman. Don Foose, recently retired from the USGS , spent four years delineating and digitizing the new watersheds. Bernadette Howe, formerly with the St. Johns River Water Management District, provided much of the foundation work on GIS techniques for handling watersheds and water quality data and mapping the information.

Several of the DEP Tallahassee staff are to be thanked for their support and review of the final document including Don Axelrad, Vivian Garfein, Mark Latch and Richard Harvey, and Machelle Jarmon, who produced numerous draft copies of this text.

List of Abbreviations

AWT	advanced wastewater treatment
BAS	DEP basin water quality study
BMPs	best management practices
BOD	biochemical oxygen demand
cfs	cubic feet per second
DEP	Department of Environmental Protection
DO	dissolved oxygen
EAA	Everglades Agricultural Area
EPA	Environmental Protection Agency
FGFWFC	Florida Game and Fresh Water Fish Commission
MGD	millions of gallons per day
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source
NWFWMD	Northwest Florida Water Management District
OFW	Outstanding Florida Waters
REACH	an EPA-designated waterbody or portion of a waterbody
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
SRWMD	Suwannee River Water Management District
STORET	EPA's water quality data STOrage and RETrieval system
SWFWMD	Southwest Florida Water Management District
SWIM	Surface Water Improvement and Management
TKN	total Kjeldahl nitrogen (organic nitrogen and ammonia)
TSI	trophic state index
WLA	wasteload allocation
WMD	Water Management District
WQI	water quality index
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY/OVERVIEW

The 305(b) Technical Report provides useful surface water quality related information in a format that is helpful to managers, planners, permit staff, and laymen, as well as water quality experts. For each of the 52 basins, a narrative summary, a map, and data tables identify the quality and trends of Florida's waterbodies, the causes of water quality problems, and the present regulatory activities conducted by DEP and EPA to improve the problem areas. It is the most widely circulated water quality assessment in the State, and also serves as the support document for the Surface Water Section of the 1994 305(b) Water Quality Assessment Main Report submitted to EPA.

The assessment required analysis of the available STORET water quality data for the 1970-1993 time period (STORET is EPA's computerized water quality database). Data from approximately 4,000 stations are assessed in this report, necessitating the extensive use of computerized assessment techniques. Water quality assessment techniques used to identify problem areas included: water quality indices, screening level exceedances, statistical trend analysis, information from special studies, and interviewing local experts. The 305(b) assessment also includes information from the 1994 DEP Nonpoint Source Assessment Survey (which is based on the responses of 50 Florida agencies).

Statewide Results From the Main Report

In the 1992 305(b) assessment report, Florida was subdivided into 1600 reaches which were based on EPA's RF2 (river reach file #2). A reach was defined as a 5 mile long section of river, or 5 square mile section of lake or estuary. Only major waterbodies were assessed in the 1992 report due to the resolution limitations imposed by the RF2 file. For 1994, Florida has been subdivided into 4400 watersheds based on EPA's RF3 and USGS watershed delineations. Many more miles of Florida waterbodies were assessed (50% more river miles, 30% more lake miles, and 20% more estuary miles) due to the increased number of watersheds available for assessment and due to efforts to collect more ambient data and store the data into STORET. Table 1 and Figure 1 show the mileages of Florida waters which were assessed in this year's report. A striking feature shown in Figure 1 is that 77% of river miles have unknown quality. This large percentage is due to the fact that EPA classified Florida's many ditches and canals as rivers, which were not assessed in this report.

A quantitative summary of the State's water quality was accomplished by determining the degree of designated use support for the different waterbody types. The vast majority of assessed Florida waterbodies meet or partially meet their designated use (92% of the river miles, 81% of the lake miles, and 96% of the estuary miles). Figure 2 shows that the river and estuary results are fairly similar, however the lake results show generally worse overall quality than the rivers and estuaries with fewer miles in the "meets use" category and more miles in the "does not meet use" category. Interestingly enough, this year's lake assessment brought in many more small lakes with good overall quality, however, Florida's largest lakes (Lake Okeechobee and Lake George) still overwhelm the State average with their large mileages of fair to poor quality.

It is very important to address both the sources of pollution and trends in water quality. In the past, the majority of identified water quality problems in the State were caused by point sources, including both domestic and industrial sources. Recently, however, nonpoint sources accounted for the majority of Florida's water quality problems. This is due to the fact that point source treatment processes have improved while there has been an increase in acreage of agricultural and urban developed land and their associated runoff.

Water quality trend analysis was performed on waterbodies which had sufficient data for analysis (467 out of 4400 waterbodies). The majority (70%) of these waterbodies (as seen in Figure 3) exhibited no significant trends. Five times as many waterbodies (24%) have improving water quality trends as have degrading trends. The improved water quality trends were generally the result of wastewater treatment plant upgrades or the additions of new regional WWTPs and nonpoint source controls in Tampa, Orlando and several other cities (as seen in Figure 4). Five percent of the waterbodies assessed for trends showed degrading trends; however, there are no regional patterns for degrading trends similar to the improving trends. The causes of degrading trends included point sources and nonpoint sources. Statewide trend detection is limited for the following reasons:

1. Only one-tenth of the waterbodies are assessed for trends.
2. The primary focus of our monitoring network is not trend assessment; most of our stations are frequently moved, and there are very few sites with long-term, monthly data.
3. Our trend assessment technique is tailored to the problem identified in #2, thus, it only identified relatively drastic changes in water quality. Subtle water quality changes due to population growth or nonpoint source treatment improvements are not picked up by this analysis.

Table 1. Mileages of Florida Waters Assessed

	Monitored 1.	Evaluated 2.	Unknown 3.	Total
River (miles)	7,025	4,855	39,978 2.	51,858
Lake (sq. miles)	1,541	400	124	2,064
Estuary (sq. miles)	2,417	1,290	347	4,054

1. Monitored data includes 1989-1993 STORET data.
2. Qualitative information or older STORET data (1970-1988)
3. This number includes 25,909 miles of ditches and canals which have not been assessed.

Table 2. Overall Designated Use Support Summary

RIVERS	(All size units in Miles)		
Degree of use support	Evaluated	Monitored	Total
Fully Supporting	1116	4378	5495
Supporting but Threatened	2259	0	2259
Partially Supporting	1139	2093	3232
Not Supporting	342	554	895
Total Size Assessed	4856	7025	11881

LAKES	(All size units in Square Miles)		
Degree of use support	Evaluated	Monitored	Total
Fully Supporting	213	494	707
Supporting but Threatened	100	0	100
Partially Supporting	53	714	766
Not Supporting	34	332	366
Total Size Assessed	400	1541	1940

ESTUARIES	(All size units in Square Miles)		
Degree of use support	Evaluated	Monitored	Total
Fully Supporting	501	1427	1928
Supporting but Threatened	402	0	402
Partially Supporting	358	851	1209
Not Supporting	28	139	167
Total Size Assessed	1290	2417	3707

Evaluated means qualitative information or older STORET data (1970-1988).
Monitored means recent STORET data (1989-1993).

FIGURE 1. MILES MONITORED, EVALUATED AND UNKNOWN

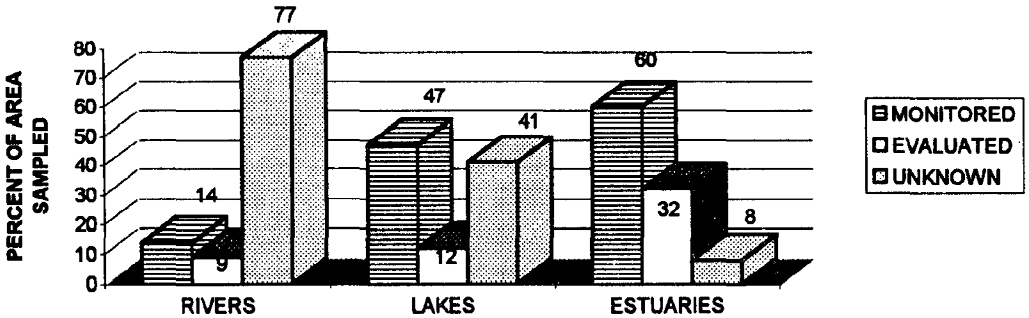


FIGURE 2. DESIGNATED USE SUPPORT IN FLORIDA WATERBODIES

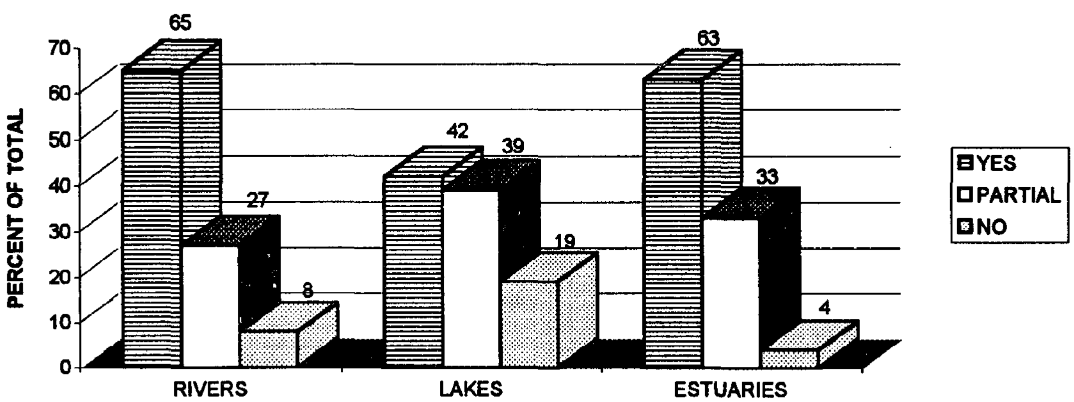
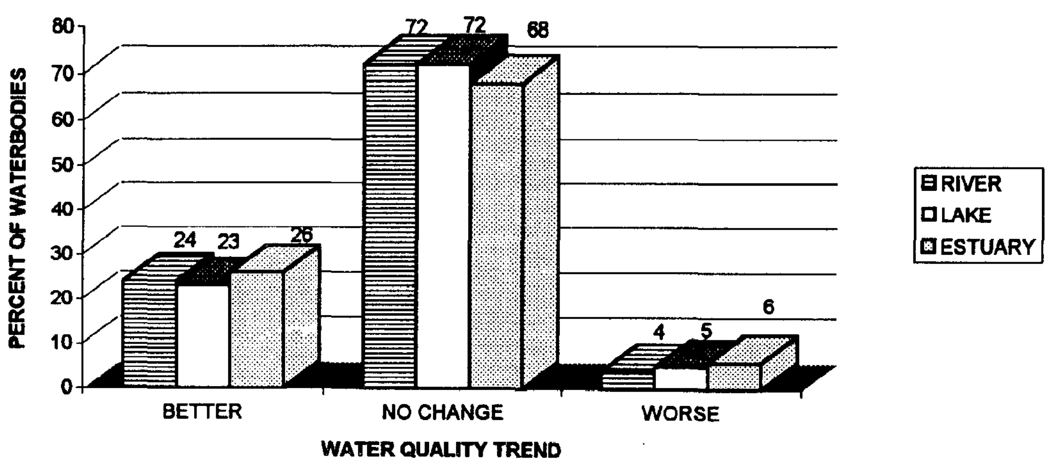
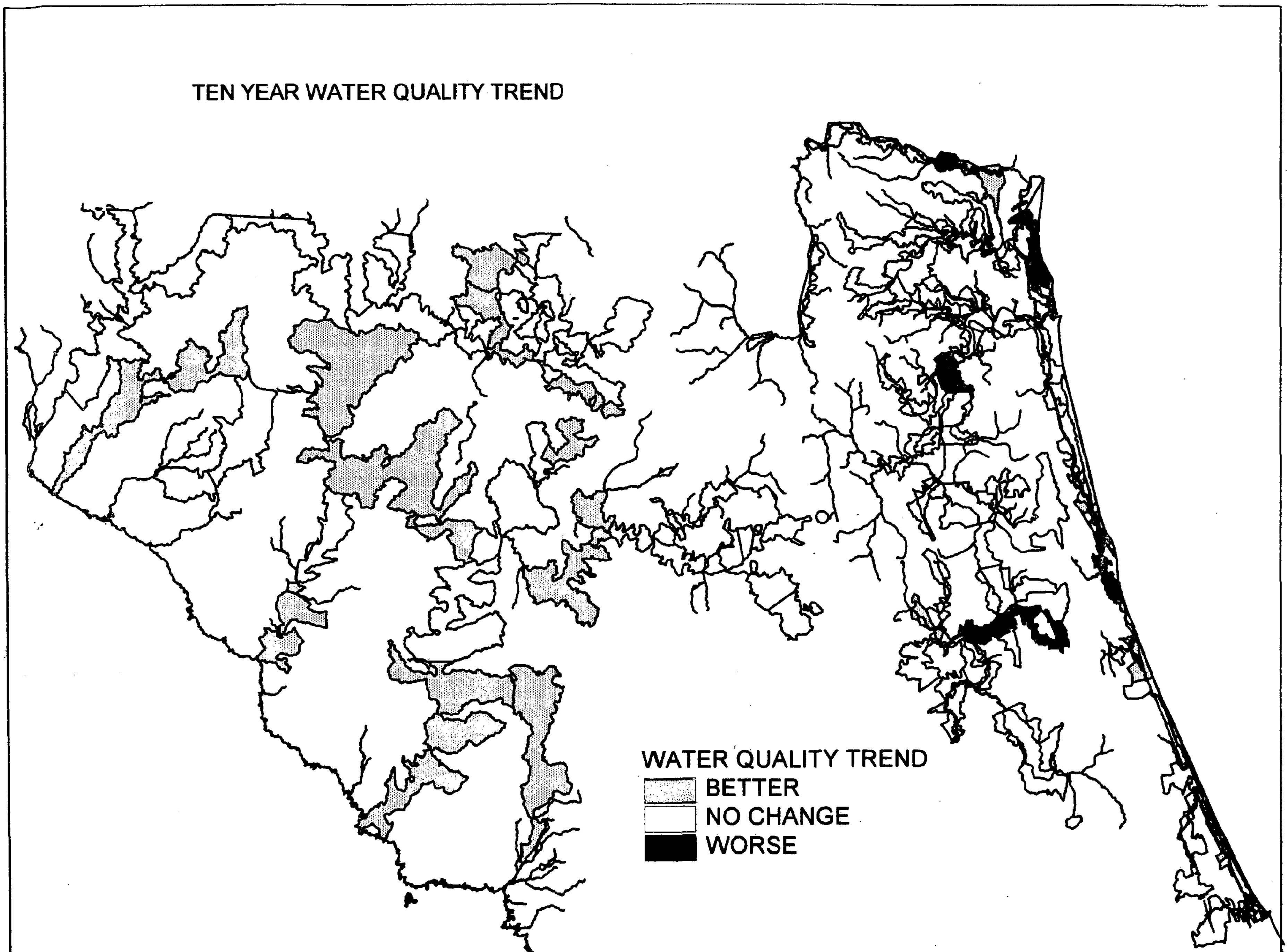
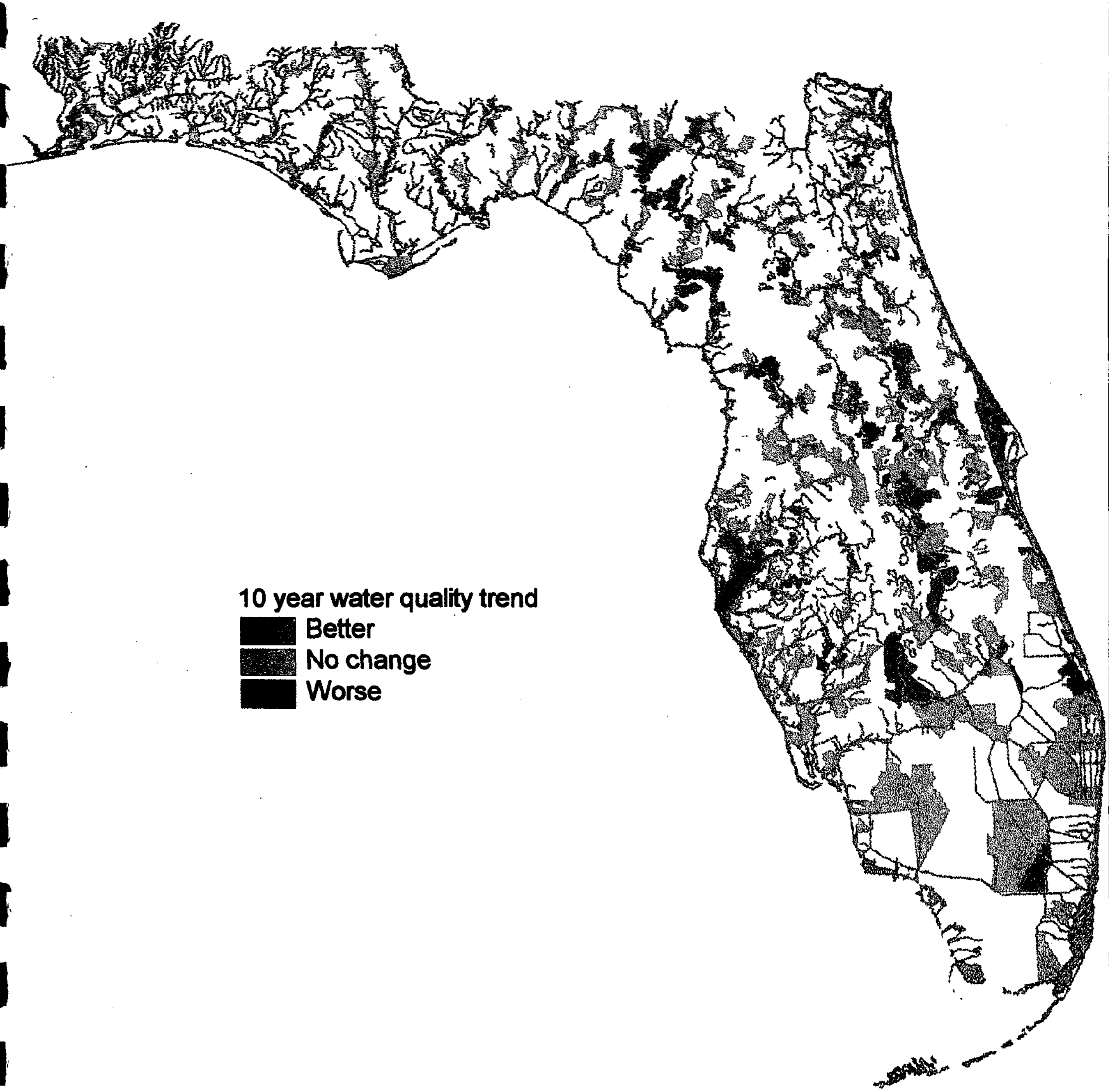


FIGURE 3. TEN YEAR WATER QUALITY TREND ANALYSIS FOR FLORIDA WATERBODIES (1984-1993)




TEN YEAR WATER QUALITY TREND
WATER QUALITY TREND
BETTER
NO CHANGE
WORSE

Ten Year Florida Water Quality Trends
(1984-1993)



Florida's surface water quality is displayed on the map on the cover of the main report. Two important conclusions can be drawn from this figure: first, the majority of Florida's surface water has good quality; and second, the majority of problems are found in Central and South Florida.

The sparsely populated northwest and west-central sections of the State have relatively better water quality than other areas. Water quality problem areas in the State are evident around the densely populated, major urban areas including: Jacksonville, Orlando, Tampa, Pensacola, the Cape Kennedy area and the southeastern Florida coast. Other areas of poor water quality, not associated with population, are found in basins with intense agricultural usage.

Pollution sources and problems in Florida are varied. The State does not have extensive industrialization, but rather localized concentrations of heavy industry centered mostly in urban areas. Many of the problems found in surface waters in urban areas can be attributed to industrial discharges. Silviculture, agriculture and various types of animal husbandry are a large part of Florida's current and historical economy. Furthermore, Florida has undergone rapid population growth over the past two decades and this continues. This has resulted in more pollution sources associated with residential development.

Florida's major surface water quality problems can be summarized into five general categories :

1. Urban Stormwater. Stormwater carries a wide variety of pollutants from nutrients to toxicants. Siltation and turbidity associated with construction activities can also be a major problem. Problem areas are concentrated around urban centers and mirror, quite well, the population map of the State. Current stormwater rules and growth management laws address this problem for new sources, but are difficult to monitor and enforce.

2. Agricultural Runoff. The major pollutants involved include nutrients, turbidity, BOD, bacteria and herbicides/pesticides. These pollutants generally do their worst damage in lakes and slow moving rivers and canals, and sometimes, the receiving estuary. Problems are concentrated in the central and southern portions of the State, and in several of the rivers entering the State from the north. Traditionally, agricultural operations have had far more lenient regulation than point sources; however, there is increasing recognition of the need for improved treatment of runoff water.

3. Domestic Wastewater. This is an area that has shown significant improvement in the last decade. Most of the waterbodies with improving water quality trends can be traced to wastewater treatment plant (WWTP) upgrades. Further advancements are being encouraged with design innovations such as wastewater discharge to wetlands, water reuse and advanced treatment. Still, a problem exists in the rural areas of the State where financial and technological resources are limited. Consequently, several of these poorly operating facilities are polluting some of Florida's relatively pristine natural waterbodies. Also, septic tank leachate contributes to the degradation of many of Florida's waterbodies.

4. Industrial Wastewater. Most notable among these are the pulp and paper mills. Because of the volume and nature of their discharge, all of the pulp and paper mills operating in the State seriously degrade their receiving waters. The phosphate and fertilizer industries are

major pollution sources (both point and nonpoint) in several of Florida's surface water basins. In addition, the mining of phosphate causes surface water hydrological modifications and major land use disturbances.

5. Hydrological Modifications. This can take the form of damming running waters, channelizing slow moving waters, or dredging, draining and filling wetlands. Such modifications are not strictly pollution sources. However, in most cases where the natural hydrological regime was modified (mostly for water quantity purposes) water quality problems have ensued. Rating the effect of hydrologic modification is difficult. Dredge and fill activities result in a loss of habitat. Disruption of wetlands with a resultant net loss of area reduces the buffering and filtering capacities and biological potential of wetlands. This is a particularly important problem in estuaries. The loss of seagrasses and other marine habitats can seriously affect the maintenance of a viable fishery.

The assessment of public health and aquatic life impacts uncovered several areas of concern. Many of these problems are associated with estuaries and are of a persistent nature. Fish with Ulcerative Disease Syndrome are still present in the lower St. Johns River. This problem was first identified in the early to mid-80s. Second, major fish kills (as many as 1 million fish) occurred in the Pensacola Bay system over the past two years. The more massive of these kills occurred in Bayou Chico. Bacterial contamination in the water and contaminated sediments of the Miami River threaten Biscayne Bay. Many urban estuaries throughout the State have elevated levels of metals and organic contaminants in their sediments. Examples are Tampa Bay, St. Johns River Estuary and Pensacola Bay. The continued loss of fishery habitat from dredge and fill and construction activities is a threat to the maintenance of a viable fishery. The extensive die off of mangroves and seagrasses and algal blooms in Florida Bay are an important State concern. The probable cause is the extensive channelization and hydrological modification of the bay's watershed exacerbated in recent years by a lack of flushing from hurricanes, high water temperature and high salinity.

On the positive side, seagrasses have increased in area in Tampa Bay and there has been an improvement in water quality in Hillsborough Bay.

Three other problems exist which are also of a persistent nature, but largely impact fresh water systems. First, fish consumption advisories for largemouth bass continue to be issued because of elevated mercury concentrations in their tissue. Second, a no fish consumption advisory has been issued for the Fenholloway River. Elevated levels of dioxin were found in fish from this stream. This waterbody receives effluent from a pulp mill. The third problem is the coliform bacteria contamination of the Miami River. Sources of this contamination are illegal sewer connections to the stormwater pipe system, leaking or broken sewer lines, and direct discharges of raw sewage when pump stations have exceeded their capacity. During acute contamination events (direct discharge of sewage) coliform bacteria counts in the Miami River and adjoining waters of Biscayne Bay are hundreds of times higher than State criteria. Efforts are being made by the City of Miami and Dade County to correct these problems.

Northeast Region Basin-by-Basin Evaluation of Water Quality

The quality of Florida waters is graphically depicted on basin maps which follow each basin description. Areas of good, fair, and poor quality are readily discernible on these maps. The following is a summary of the status of the quality of waters in northeast Florida:

The Steinhatchee River basin's major water quality problem area is the Fenholloway River which is seriously affected by the effluent from a large paper mill. Although the discharge quality improved in the early seventies, the river still has high nutrients and color and low DO and biological diversity. An EPA study indicated impacts to the bay at the mouth of the Fenholloway. DEP conducted a use attainability study of the river, and has changed its classification from Industrial (Class V) to Recreation (Class III). The upper and lower Suwannee River basins, which receive a considerable quantity of ground water spring flow, have good water quality. Exceptions are those upper river tributaries that receive mining wastewater from Occidental Chemical Company. Sections of the Suwannee below these tributaries have some elevation in fluoride and phosphorus concentrations. Other direct threats to the Suwannee include agricultural and silviculture runoff, septic tank leachate, and nitrates from dairy farms. Major tributaries of the Suwannee are generally of good quality, but are threatened by local pollution sources. The North Withlacoochee River receives agricultural runoff and effluent from a paper mill (indirectly), and before entering Florida receives discharges of industrial effluent and municipal wastewater. The Alapaha River basin has good water quality. The Santa Fe River has several major springs and very good water quality. A tributary of the Santa Fe River, New River, receives discharge from a WWTP at Raiford and indirectly from the Town of Lake Butler. Bacteria, nutrient, and turbidity values are elevated near the discharge. The water quality of the Santa Fe River below New River reflects the reduced quality of the New River. Alligator Lake in the upper basin is degraded from the Lake City WWTP discharge and urban runoff and is the focus of a SWIM study. Lake Rowell (in the Santa Fe basin) has a eutrophication problem.

In general, the St. Marys River has good water quality. The South Prong of the St. Marys, Little St. Marys River, and Turkey Creek receive effluents from WWTP. Historically, problems of low DO, high nutrient levels, and high bacteria counts were present. Several pulp mill operations are located near the mouth of the river and along the estuarine Amelia River. Nassau River has good water quality except for Mills Creek which receives dairy farm runoff.

Downstream of Lake George, the St. Johns River is wide, shallow and sluggish with frequent, tidally influenced reverse flows. Many of the tributary systems have water quality problems which impact the river. Agricultural runoff and domestic discharge affect the Haw Creek/Crescent Lake tributary drainage. A paper mill causes problems in the Rice Creek tributary system. Agricultural and urban runoff affect Black Creek and Peters Creek. The Julington Creek, Durbin Creek, and

Doctors Lake watersheds are highly developed and water quality problems due to urban runoff and septic tank leachate are evident.

Water quality problems arising from septic tank leachate and WWTP discharge are common throughout the Jacksonville area of the river and its tributaries. In addition, numerous industries discharge to the river system. As a result, most of the tributaries, notably the Ortega, Cedar and Trout Rivers, have fair to poor water quality from Lake George to its mouth due to the polluted tributaries, direct discharge and significant urban runoff. A persistent problem in the lower St. Johns basin has been the presence of fish with Ulcerative Disease Syndrome.

The east coast estuarine waters from Jacksonville to Ft. Pierce have localized impacts from wastewater discharges, stormwater runoff, causeways which reduce hydraulic flushing, and shoreline vegetation disruption. Areas of greatest impact are the intracoastal waterway near Palm Valley (below Jacksonville Beach), the Matanzas River at St. Augustine, and the Halifax River between Ormond Beach and Port Orange.

INTRODUCTION AND METHODS

This section describes the water quality assessment procedures used by the Bureau of Surface Water Management to prepare the 1994 Florida Water Quality Inventory [305(b)]. The procedures are:

1. Divide State into Assessment Watersheds.
2. Inventory STORET data.
3. Calculate Stream Water Quality Index (WQI).
4. Calculate Lake/Estuary Trophic State Index (TSI).
5. Apply Screening Levels.
6. Conduct Trend Analysis.
7. Conduct Toxic Pollutant Assessment.
8. Conduct Nonpoint Source Assessment.

Florida's 52 major river basins were subdivided into 4400 watersheds of approximately five square miles each. The predominate waterbody within each watershed was identified and classified as a lake, stream, or estuary. Each watershed and its waterbody formed an assessment unit and all water quality stations within the watershed were aggregated as if they were from the same site (the stations were screened for unwanted sites, such as, point source discharge sites). A water quality inventory was performed on EPA's STORET database. The inventory included the years 1970 through 1993 and was classified as recent (1989-1993) or historic (1970-1988). Tables of water quality data were prepared for each of Florida's 52 basins. Three procedures were then used to assess the water quality data. A Water Quality Index was calculated to determine the overall quality of Florida streams and rivers. The Water Quality Index summarizes information from six categories including water clarity (turbidity and total suspended solids), dissolved oxygen, oxygen demanding substances (biochemical oxygen demand, chemical oxygen demand, and total organic carbon), nutrients (total nitrogen and total phosphorus), bacteria (total coliform and fecal coliform), and macroinvertebrate diversity index (based on natural substrate samples, artificial substrate samples and Beck's Biotic Index). The water quality of lakes and estuaries is described by the Trophic State Index which is a measure of the potential for algal or aquatic weed growth. The components which make up the Trophic State Index include total nitrogen, total phosphorus, chlorophyll and Secchi depth. Screening levels for 19 water quality parameters were also used to determine the quality of Florida lakes, estuaries and streams.

The water quality indices and screening levels have all been tailored to Florida's water quality by using the actual distribution of Florida data to determine the water quality criteria used by the procedures. Specific information on each of the procedures is described in the following sections.

Watershed as the Assessment Unit

In the 1992 305(b) assessment report, Florida was subdivided into 1600 reaches which were based on EPA's RF2 (river reach file #2). A reach was defined as a 5 mile long section of river, or 5 square mile section of lake or estuary. Only major waterbodies were assessed in the 1992 report due to the resolution limitations imposed by the RF2 file. For 1994, Florida has been subdivided into 4400 watersheds based on EPA's RF3 and USGS watershed delineations. The original 1600 reach delineations have been kept intact, however, many additional watersheds have been added due to the increased resolution of RF3 and the USGS watersheds which cover the entire State. USGS was contracted to develop useable, small watersheds (approximately 5 square miles) using watershed boundaries identified on USGS topological maps and ARC/INFO GIS techniques. USGS completed 75% of the State, but unfortunately they did not delineate watersheds in south Florida (USGS subregion 0309). Watersheds for South Florida were adapted from a much coarser delineation developed by the South Florida Water Management District. The resulting watersheds in this area are about 50 square miles each, ten times larger than those for the rest of the State.

The major waterbody within each watershed was identified and named. Usually each watershed encompassed one major or one minor named waterbody (similar to the 1992 reach structure). The length of each stream waterbody and the area of lake and estuary waterbodies is essential information. The length of stream waterbodies was determined by GIS measurements of the RF3 trace (or assigned a length of 5 miles if no RF3 trace was available). The area of lake and estuary waterbodies was determined with crude GIS aerial measurement techniques (if estuary waterbodies had no RF3 traces, their area was set to 5 square miles and unknown lake waterbodies were assigned an area of 1 square mile). The water quality within each waterbody is assumed to be homogenous (if data prove this assumption to be wrong, then the waterbody was subdivided). GIS techniques were used to assign STORET sites to their respective watersheds and the location of each site was visually inspected on a GIS map. If more than one named waterbody showed up in a watershed (based on the STORET data within a watershed), then the watershed was subdivided.

Inventory of STORET Data

An inventory of data was retrieved from STORET for the 1970-1993 time period. If data within a watershed were available for the current time period (defined as 1989-1993), then historical data was not examined, except for trend analysis. If no current data were found, then historic data (defined as 1970-1988) were used for the assessment. Fifty STORET parameter codes representing 21 different water quality parameters were inventoried (Table 3). There are about 8000 Florida stations in STORET which were sampled in 1970-1993. These stations are located in 1500 of the 4400 watersheds. Annual average (median) water quality was calculated for each of these stations and the data were stored on a local IBM Personal computer. In order for an annual average to be calculated for a station, the station had to be sampled at least twice within each year. STORET remark

Table 3. Storet Water Quality Assessment Parameters.

Category	Storet Parameter	Name	Storet Parameter Code
Coliform	Fecal Coli	MPN-FCBR/100ml	31616
Coliform	Fecal Coli	MPNECMED/100ml	31615
Coliform	Total Coli	MGIMENDO/100ml	31501
Coliform	Total Coli	MPN CONG/100ml	31505
Conductivity	Conductivity	at 25c micromho	95
Conductivity	Conductivity	Field micromho	94
Dissolved Oxygen	Dissolved Oxygen	% saturation	301
Dissolved Oxygen	Dissolved Oxygen	mg/l	300
Dissolved Oxygen	Dissolved Oxygen	Probe mg/l	299
Diversity Index	Biotic Index	BI	82256
Diversity Index	Diversity Index	Artificial substrate	82251
Diversity Index	Diversity Index	Natural substrate	82246
Flow	Stream Flow	cfs	60
Flow	Stream Flow	inst.-cfs	61
Oxygen Demand	BOD 5 day	mg/l	310
Oxygen Demand	COD Hi Level	mg/l	340
Oxygen Demand	Tot Organic Carbon	C mg/l	680
pH-Alkalinity	pH SU		400
pH-Alkalinity	pH SU	lab	403
pH-Alkalinity	Total Alkalinity	CaCO3 mg/l	410
Temperature	Temperature Water	cent	10
Trophic Status	Chlorophyll A	mg/l	32230
Trophic Status	Chlorophyll A	mg/l	32217
Trophic Status	Chlorophyll A	mg/l	32210
Trophic Status	Chlorophyll A	mg/l corrected	32211
Trophic Status	Chlorophyll Total	mg/l	32234
Trophic Status	Chlorophyll	total ug/l	32216
Trophic Status	Nitrogen ammonia	Diss-NO2 mg/l	71846
Trophic Status	Nitrogen NH3+NH4-	N Diss mg/l	608
Trophic Status	Nitrogen NH3_NH4-	N total mg/l	610
Trophic Status	Nitrogen Nitrate	Diss-NO3 mg/l	71851
Trophic Status	Nitrogen Nitrate	Tot-NO3 mg/l	71850
Trophic Status	Nitrogen NO2&NO3	N-Diss mg/l	631
Trophic Status	Nitrogen NO2&NO3	N-Total mg/l	630
Trophic Status	Nitrogen NO3-N	Diss mg/l	618
Trophic Status	Nitrogen NO3-N	Total mg/l	620
Trophic Status	Nitrogen Org N	N mg/l	605
Trophic Status	Nitrogen Tot Kjel	N mg/l	625
Trophic Status	Nitrogen Total N	As NO3 mg/l	71887
Trophic Status	Nitrogen Total N	N mg/l	600
Trophic Status	Phosphorus	OrthoPO4 mg/l	660
Trophic Status	Phosphorus Total	As PO4 mg/l	71886

Table 3. Storet Water Quality Assessment Parameters (continued).

Category	Storet Parameter	Name	Storet Parameter Code
Trophic Status	Phosphorus Total	mg/l P	665
Trophic Status	Transparency	Secchi Inches	77
Trophic Status	Transparency	Secchi Meters	78
Water Clarity	Color	PT-CO Units	80
Water Clarity	Color-AP	Pt-CO Units	81
Water Clarity	Residue Tot NFLT	mg/l	530
Water Clarity	Turbidity	JKSN JTU	70
Water Clarity	Turbidity	TRBIDMTR HACH FTU	76

codes also present a problem in data analysis when a data value is recorded as "less than" the actual value reported. In these cases the reported value was multiplied by 0.5 to adjust for the "less than" condition. Data with STORET remark codes indicating that the reported value was "greater than" the actual value were dropped from further analysis. A Water Quality Index value was calculated for each stream/river annual median and a Trophic State Index value was calculated for each lake/estuary annual median.

Florida Stream Water Quality Index Procedure

To assess Florida stream water quality, a Florida stream Water Quality Index (WQI) was developed and first used in the 1988 305(b) report. The WQI is based on the quality of water as measured by six water quality categories (water clarity, dissolved oxygen, oxygen demanding substances, bacteria, nutrients and biological diversity). Each category may have more than one parameter as shown in Table 4. Raw (annual average) data are converted into index values which range from 0 to 99 for the six categories. Index values correspond to the percentile distribution of stream water quality data in Florida (Table 4). [The percentile distribution of STORET water quality data were determined in 1987 for 2,000 ambient, stream STORET locations in Florida.] For example, Table 4 shows the BOD concentrations ranged from 0.8 mg/l (10 percentile) to 5.1 mg/ (90 percentile) with a median value of 1.5 mg/l (50 percentile). A BOD concentration of 0 to less than 0.8 mg/l is assigned an index value of 0 to 9, etc.

The overall WQI is the arithmetic average of the six water quality index categories. The index for each category is determined by averaging its component parameter index values. Missing water quality parameters and missing water quality categories are ignored in the final calculation. Therefore, the final WQI is based on an average of anywhere from 1 to 6 water quality index categories. Table 5 shows an example calculation of the WQI. The WQI can be calculated from just one index category; however, it becomes more reliable as more categories are used in its calculation.

In order to determine the range of values of the WQI which correspond to good, fair and poor quality, the WQI was correlated with the EPA National Profiles Water Quality Index for Florida data. (The EPA WQI was used in the 1986 305(b)). Based on this correlation, the cutoff values for the WQI were determined as follows: 0 to less than 45 represents good quality, 45 to less than 60 represents fair quality, and 60 to 99 represents poor quality.

The Florida stream Water Quality Index has several advantages over indices used previously. First, the index is tailored to Florida water quality data, since it is based on the percentile distribution of Florida stream data. Second, it uses the water quality categories which are felt to be the most important measures of water quality in Florida: water clarity, dissolved oxygen, oxygen demanding substances, nutrients, bacteria and biological diversity. Third, it is simple to understand and calculate and does not require a mainframe computer or any complex data transformations or averaging schemes. Finally, the index

Table 4. Florida Stream Water Quality Index Criteria.
Percentile Distribution of STORET Data.

Parameter	Unit	Best Quality 10%	20%	30%	40%	Median Value 50%	60%	70%	Worst Quality 80%	90%
** Category: Water Clarity										
Turbidity	JTU	1.50	3.00	4.00	4.50	5.20	8.80	12.20	16.50	21.00
Total Suspended Soldis	mg/l	2.00	3.00	4.00	5.50	6.50	9.50	12.50	18.00	26.50
** Category: Dissolved Oxygen										
Dissolved Oxygen	mg/l	8.00	7.30	6.70	6.30	5.80	5.30	4.80	4.00	3.10
** Category: Oxygen Demand										
Biochemical Oxygen Demand	mg/l	0.80	1.00	1.10	1.30	1.50	1.90	2.30	3.30	5.10
Chemical Oxygen Demand	mg/l	16.00	24.00	32.00	38.00	46.00	58.00	72.00	102.00	146.00
Total Organic Carbon	mg/l	5.00	7.00	9.50	12.00	14.00	17.50	21.00	27.50	37.00
** Category: Nutrients										
Total Nitrogen	mg/l as N	0.55	0.75	0.90	1.00	1.20	1.40	1.60	2.00	2.70
Total Phosphorus	mg/l as P	0.02	0.03	0.05	0.07	0.09	0.16	0.24	0.46	0.89
** Category: Bacteria										
Total Coliform	#/100 ml	100.00	150.00	250.00	425.00	600.00	1100.00	1600.00	3700.00	7600.00
Fecal Coliform	#/100 ml	10.00	20.00	35.00	55.00	75.00	135.00	190.00	470.00	960.00
** Category: Biological Diversity										
Diversity Index Nat. Substrate	Index	3.50	3.10	2.80	2.60	2.40	2.15	1.95	1.50	1.20
Diversity Index Art. Substrate	Index	3.55	3.35	3.20	3.05	2.90	2.65	2.40	1.95	1.35
Beck's Biotic Index	Index	32.00	28.00	23.00	18.50	14.00	11.00	8.00	5.50	3.50

Table 5. An Example Calculation of the Florida Stream Water Quality Index (WQI).

Water Quality Category[1]	Water Quality Parameter[2]	Value[3]	Parameter Index Value[4]	Index Average[5]
Water Clarity	Turbidity	3.9 mg/l	29	40
Water Clarity	Total Suspended Solids	7.0 mg/l	52	
Dissolved Oxygen	Dissolved Oxygen	5.4 mg/l	58	58
Oxygen Demanding Substances	BOD	2.8 mg/l	75	
Oxygen Demanding Substances	COD	31.0 mg/l	29	52
Oxygen Demanding Substances	TOC	.	--	
Nutrients	Total Nitrogen	1.87 mg/l	77	79
Nutrients	Total Phosphorus	0.56 mg/l	82	
Bacteria	Total Coliform	1800 MPN/100 ml	71	70
Bacteria	Fecal Coliform	1900 MPN/100 ml	70	
Macroinvertebrate Diversity	Natural Substrate	1.7	76	
Macroinvertebrate Diversity	Artificial Substrate	2.3	72	69
Macroinvertebrate Diversity	Beck's Biotic Index	11.0	60	
				WQI = 61[6]

1 - These are the 6 water quality categories.
2 - These are the 13 water quality parameters which make up the 6 categories.
3 - These are the actual data values ('.' indicates no measurement was taken for this parameter).
4 - The index value is based on the percentile distribution values shown in Table 4.
5 - The category average is based on an average of each of the water quality parameter values.
6 - The WQI is an average of the category index values, i.e., WQI = (40+58+52+79+70+69)/6=61.

works; it nicely identifies areas of good, fair, and poor water quality that correspond to professional and public opinion.

A toxic pollutants category would be a valuable addition to the index; however, toxic pollutants were not included in the index since there is relatively little data in Florida (compared to the amount of data for conventional pollutants). Toxic pollutants were assessed separately as discussed later in this section of the report.

Trophic State Index Procedure

The Trophic State Index procedure provides an effective method of classifying lakes based on the lake's chlorophyll, Secchi depth, nitrogen and phosphorus concentrations. The index was developed in 1982 in response to the EPA Clean Lakes Program and is documented in the Classification of Florida Lakes Report by the University of Florida, Department of Environmental Engineering Sciences. This index remains unchanged from the 1988 305(b) report.

The index is based on a trophic classification scheme developed in 1977 by R.E. Carlson. It relies on three trophic indicators to describe the trophic status of a lake. The goal was to have each indicator relate to algal biomass such that a 10 unit change in the index would represent a doubling or halving of algal biomass. Carlson developed indices based on Secchi disc transparency, chlorophyll concentration and total phosphorus concentration. The Florida Trophic State Index (TSI) is based on the same rationale, but also includes total nitrogen concentration as a fourth index. Criteria were developed for Florida lakes from a regression analysis of data on 313 Florida lakes. The desirable upper limit for the index is set at 20 ug/l chlorophyll which corresponds to an index of 60. Doubling the chlorophyll concentration to 40 ug/l results in an index increase to 70 which is the cutoff for undesirable (or poor) lake quality. Index values from 60 to 69 represent 'fair' water quality. The criteria for chlorophyll, Secchi depth, total phosphorus and total nitrogen concentrations are shown in Table 6.

A nutrient index is also calculated based on phosphorus and nitrogen concentrations and the limiting nutrient concept. The limiting nutrient concept identifies a lake as phosphorus limited if the nitrogen to phosphorus concentration ratio is greater than 30, as nitrogen limited if the ratio is less than 10, and balanced (depending on both nitrogen and phosphorus) if the ratio is 10-30. Thus, the nutrient TSI is based solely on phosphorus if the ratio is greater than 30, solely on nitrogen if less than 10, or based on both nitrogen and phosphorus if the ratio is between 10 and 30. An overall index (TSI) is calculated based on the average of the chlorophyll TSI, the Secchi depth TSI and the nutrient TSI. For this index to be calculated, both nitrogen and phosphorus measurements are required for the sample. The lake trophic state index was also applied to Florida estuaries to describe estuarine water quality. The criteria for the estuary quality ratings is 10 less than the lake ratings (i.e., good estuarine water quality is a TSI value of 0-49, fair quality is 50-59, and poor quality is a value of 60-100). Table 7 shows an example TSI calculation.

Table 6. Trophic State Index (TSI) for Lakes and Estuaries.

For Lakes: 0-59 is good, 60-69 is fair, 70-100 is poor
For Estuaries: 0-49 is good, 50-59 is fair, 60-100 is poor

Trophic State Index TSI	Chlorophyll CHLA (ug/l)	Secchi Depth SD (m)	Total Phosphorus TP (mgP/l)	Total Nitrogen TN (mgN/l)
0	0.3	7.4	0.003	0.06
10	0.6	5.3	0.005	0.10
20	1.3	3.8	0.009	0.16
30	2.5	2.7	0.01	0.27
40	5.0	2.0	0.02	0.45
50	10.0	1.4	0.04	0.70
60	20.0	1.0	0.07	1.2
70	40	0.7	0.12	2.0
80	80	0.5	0.20	3.4
90	160	0.4	0.34	5.6
100	320	0.3	0.58	9.3

TSI equations which generate the above criteria:

$CHLA_{TSI} = 16.8 + [14.4 \times LN\ (CHLA)]$ (use Natural Log)

$SD_{TSI} = 60 - [30 \times LN\ (SD)]$

$TN_{TSI} = 56 + [19.8 \times LN\ (TN)]$

$TP_{TSI} = [18.6 \times LN\ (TP \times 1000)] - 18.4$

$TSI = (CHLA_{TSI} + SD_{TSI} + NUTR_{TSI^*}) / 3$

* Limiting Nutrient considerations for Calculating $NUTR_{TSI}$:

If $TN/TP > 30$ then $NUTR_{TSI} = TP_{TSI}$

If $TN/TP < 10$ then $NUTR_{TSI} = TN_{TSI}$

If $10 < TN/TP < 30$ then $NUTR_{TSI} = (TP_{TSI} + TN_{TSI}) / 2$

Table 7. An Example Calculation of the Trophic State Index (TSI) (See Table 6 for Formulas).

	Annual Average	TSI Calculation	Average TSI
Chlorophyll	6.0 ug/l	42.6[1.]	42.1
Secchi Depth	1.8 meters	42.3[2.]	42.3
Phosphorus*	0.04 mg P/l	50.2[3.]	
Nitrogen*	0.67 mg N/l	48.1[4.]	49.2[5.]
			45.0[6.]

1. CHLA = 16.8 + [14.4 x LN (6.0)] = 42.1 (use Natural Log)

2. SD = 60 - [30 x LN (1.9)] = 42.3

3. TP = [18.6 x LN (0.04 x 1000)] - 18.4 = 50.2

4. TN = 56 + [19.8 x LN (0.67)] = 48.1

5. TN/TP Ratio = 0.67/0.04 = 16.7 therefore, TSI NUTR = an average of TSI Phosphorus and TSI Nitrogen = (50.2 + 48.1)/2 = 49.2

6. (42.6 + 42.3 + 49.2)/3 = 45

* Note: If either phosphorus or nitrogen sampling information are missing, then the index is not calculated. Chlorophyll and/or Secchi Depth may be missing and the index will be calculated.

Screening Levels

Screening levels were used to determine water quality problems caused by each of nineteen water quality parameters (Table 8). Screening levels were based on either Florida criteria or on criteria established by professional judgment when quantitative Florida criteria are absent. Different screening levels were developed for streams, lakes and estuaries to take into account the natural differences among these waterbodies. The criteria which were established by professional judgment were based on the percentile distribution of Florida data.

The eightieth percentile was chosen as the cutoff between acceptable and unacceptable water quality. This means that 80% of Florida's water quality data will have acceptable levels. Table 8 identifies the screening levels used, the typical values measured and the Florida criteria for streams, lakes and estuaries. Screening level exceedances are noted in the data tables for each watershed in each basin.

Trend Analysis

Water quality trend analysis was performed on 12 water quality parameters (plus the overall stream water quality index and the trophic state index) for 460 watersheds. The time frame for the analysis is from 1984-1993. The analysis was quite simple; a non-parametric correlation analysis (Spearman's Ranked Correlation) was used to analyze the ten-year trend of the annual STORET station medians for each watershed. There may have been only one station analyzed within a watershed resulting in a maximum of ten years of data, or there may have been many stations sampled within the watershed resulting in the analysis of many more yearly station medians and a more meaningful trend analysis.

A separate trend assessment technique was used to analyze stream, lake, and estuary waterbodies. Stream trend analysis utilized the trend information from eight water quality parameters (bacteria, turbidity, total suspended solids, BOD, dissolved oxygen, Secchi depth, nitrogen and phosphorus) plus the overall water quality index. Lake and estuary trend analysis focused on four trophic state parameters (chlorophyll, Secchi depth, nitrogen and phosphorus) plus the trophic state index.

The overall trend of each waterbody was determined by comparing the number of improved water quality parameters to the number of degraded water quality parameters. Some waterbodies showed quite strong trends. If a waterbody showed no trends, or just one parameter showed a trend (or the number of improved trends minus the number of degraded trends is zero or one), then the trend is classified as "no change". This trend analysis must be considered preliminary due to the simplicity of the technique.

Table 8. Water Quality Assessment Parameters For Florida Streams, Lakes and Estuaries, Screening Levels-Typical Values-Florida Criteria.

Parameter	Units	Screening Level	Typical Values 10%	(Median)	90%	Florida Criteria (17-302) Class III
** Water Body Type: Stream						
Alkalinity	$CaCO_3$ mg/l		13	(75)	150	20.0 mg/l min.
Beck's Biotic Index	Index #	<5.5	4	(14)	32	
BOD 5 Day	mg/l	>3.3	0.8	(1.5)	5.1	Not cause DO<5 mg/l
Chlorophyll	ug/l		1	(6)	30	
COD	mg/l	>102	16	(46)	146	
Coliform-Fecal	#/100 ml	>470	10	(75)	960	200/100 ml
Coliform-total	#/100 ml	>3700	100	(600)	7600	1000/100 ml
Color	Platinum-Color Units		21	(71)	235	No nuisance conditions
Conductivity	micromho	>1275	100	(335)	1300	1275 or 50% abv background
Dissolved Oxygen	mg/l	<4.0	3.1	(5.8)	8.0	5.0 mg/l
Diversity Artificial Sub	index	<1.95	1.4	(2.9)	3.6	min. 75% of DI
Diversity Natural Substr	index	<1.50	1.2	(2.4)	3.5	min. 75% of DI (marine)
DO % Saturation	%		36	(68)	90	
Fecal Strep	#/100 ml		20	(15)	1700	
Fluoride	mg/l		0.1	(0.2)	0.8	10.0 mg/l
Nitrogen-total	mg/l as N	>2.0	0.5	(1.2)	2.7	Not cause imbalance
pH	standard units		6.1	(7.1)	7.9	<6.0 >8.5
Phosphorus-total	mg/l as P	>0.46	0.02	(0.09)	0.89	Not cause imbalance
Secchi Disc Depth	meters		0.4	(0.8)	1.7	min. 90% background
Temperature	centigrade		19	(23)	28	No nuisance conditions
Total Organic Carbon	mg/l	>27.5	5	(14)	37	
Total Suspended Solids	mg/l	>18.0	2	(7)	26	
Turbidity	JTU FTU	>16.5	1.5	(5)	21	29 NTUs above background
** Waterbody Type: Lake						
Alkalinity	$CaCO_3$ mg/l	>20.	2	(28)	116	20.0 mg/l min.
Chlorophyll	ug/l	>40.	1	(12)	70	
Nitrogen-total	mg/l as N	>2.0	0.4	(1.1)	2.5	Not cause imbalance
Phosphorus-total	mg/l as P	>0.12	0.01	(0.05)	0.29	Not cause imbalance
Secchi Disc Depth	meters	<0.7	0.4	(0.9)	2.7	Min. 90% background
** Waterbody Type: Estuary						
Chlorophyll	ug/l	>40	1	(9)	36	
Nitrogen-total	mg/l as N	>2.0	0.3	(0.8)	1.6	Not cause imbalance
Phosphorus-total	mg/l as P	>0.12	0.01	(0.07)	0.20	Not cause imbalance
Secchi Disc Depth	meters	<0.7	0.6	(1.1)	3.0	Min. 90% background

Toxic Pollutant Assessment

The assessment of toxic pollutants in Florida's waters was accomplished by an inventory of 9 STORET toxic metal parameters for 1991-93 (Table 9). The Florida surface water quality standards (Chapter 17-302, Florida Administrative Code) were used to assess whether the toxic pollutant was found at an elevated level. Several standards are based on hardness levels, however, since hardness levels were not available in all cases, a hardness value of 100 mg/l as calcium carbonate was assumed. An elevated level was defined as any exceedance of the standard for any of the nine metals. Generally, each waterbody was sampled two or three times for several of the metals during the last three years.

Nonpoint Source Assessment

An extensive assessment of nonpoint source impacts on Florida's waters was conducted in 1988 through the use of a questionnaire sent to all major State agencies (Water Management Districts, Division of Forestry, Game and Fresh Water Fish Commission), city and county offices, U.S. Soil Conservation Service, U.S. Forestry Service, Regional Planning Councils, local Soil and Water Conservation Districts, citizen environmental groups (Sierra Clubs, Audubon Society and others) and professional outdoor guides. The respondents (approximately 150 agencies and 350-400 participants) to the questionnaire identified nonpoint sources of pollution, environmental pollution symptoms (fish kills, algal blooms, etc.) pollutants and miscellaneous comments. The assessment has been updated in 1994. The 1994 nonpoint source assessment was performed more efficiently than the 1988 version due largely to the use of GIS technology for compiling and displaying the data, and also advancements in the questionnaire methodology. Scannable forms were used eliminating the need to key punch data and integration with the 305b report was much improved.

Florida's 1994 nonpoint source assessment was performed using a qualitative, best professional judgment approach. Unlike point source pollution analysis and its readily available STORET ambient data, there is rarely any convenient database of water quality monitoring data that has been designed for analyzing impacts of nonpoint source pollution on surface waters. Therefore, the assessment procedure was designed to make use of the knowledge of experienced field personnel who had information about individual waterbodies. The 1994 survey was sent to essentially the same group of professionals as the 1988 report and approximately fifty respondents identified nonpoint sources of pollution, environmental symptoms of pollution (fish kills, algal blooms, etc.), degree of impairment (rating) of a waterbody and miscellaneous comments. A total of 1720 watersheds or about 40 % of the total watersheds were qualitatively assessed by the respondents. Data tables summarizing the 1994 NPS survey are presented for each basin in this report. The remainder of this section describes the information presented in these tables.

Table 9. Toxic Metals in the Water Column.

Metal	Storet Parameter Number	Number of Waterbodies Sampled	Florida Criteria (ppb)	% of Waterbodies With Exceedances
Arsenic	1002	162	50	0%
Cadmium	1027	211	1.1	17%
Chromium	1034	155	207*	0%
Copper	1042	330	12*	10%
Iron	1045	378	1000	22%
Lead	1051	240	3.2*	30%
Mercury	71900	129	0.012	47%
Nickel	1067	130	158*	0%
Zinc	1092	253	106	10%

* actual criteria is dependent on water hardness which was assumed to be 100 mg/l as calcium carbonate since hardness was not available in all waterbodies

The impairment rating of a waterbody was defined as status of waters within a watershed as determined by support or nonsupport of designated use. The status of a watershed was dependent on making a determination of designated use support that applied to all surface waters within the aerial extent of that watershed. Designated use refers to the classification or standards and criteria applied to all Florida waters.

Impairment rating categories used were as follows:

1. Good (meets designated use). All surface waters in the watershed are supporting their use classification with no evidence of nonpoint source problems.
2. Threatened (meets designated use). All surface waters in the watershed are attaining their use classification, but in the absence of any future management activities, it is suspected that within five years at least some of the surface waters in the watershed will not support their designated use.
3. Fair (partially meets designated use). Some, but not all, surface waters in the watershed are not supporting their designated use.
4. Poor (does not meet use). All surface waters in the watershed are not supporting their designated use.

Nonpoint source pollution is generally associated with land use activities which do not have a well-defined point of discharge, such as discharge from a pipe or smoke stack. Nonpoint contaminants are carried to waterbodies by direct runoff or percolation through the soil to groundwater. There are many different potential source areas. Some of the common activities and sources which were considered in the nonpoint source assessment include:

1. Construction site runoff. This type of source can provide sediment, chemicals and debris to surface waters.
2. Urban stormwater. Runoff from buildings, streets and parking lots carries with it oil, grease, metals, fertilizers and other pollutants.
3. Land disposal. Leachate from septic tanks and landfills may pollute groundwater or local surface waters. Contamination of surface waters can be by either by direct runoff or discharge from groundwater.
4. Agricultural runoff. Runoff from fields and pastures carries with it sediments, pesticides and animal wastes (which can be a source of bacteria and viruses and nutrients).
5. Silvaculture operations. Logging activities which erode forest soils add turbidity and suspended solids to local surface waters.
6. Mining. This type of activity can cause siltation in nearby waterbodies, release of radioactive materials to groundwater, discharge of acid mine drainage and depletion of water supplies in aquifers.

7. Hydrologic modification. Dams, canals, channelization and other alternations to the flow of a waterbody result in habitat destruction and in general water quality deterioration.

Abbreviations were used for the nonpoint source categories in the NPS data tables which are found in each basin write-up on the following pages. Those abbreviations correspond to the sources as described below:

AG	=	Agricultural runoff
RE	=	Resource extraction or mining
SL	=	Silvaculture or for operations
LD	=	Land disposal
UR	=	Urban runoff
CN	=	Construction site runoff
HM	=	Hydrologic Modification
OT	=	Other nonpoint source
IND	=	Industrial site runoff
STP	=	Sewage treatment plant

Data for the last two point source categories were not obtained from the 1994 NPS assessment survey, but rather they come from the 1992 305(b) Report.

Respondents were provided with 15 choices of pollutants and 9 choices of symptoms for use in characterizing the status of a watershed. Pollutant choices or categories and their descriptions are provided below:

1. Nutrients. An imbalance of nitrogen and or phosphorus which resulted in algal blooms or nuisance aquatic plant growth. Standards for Class III waterbodies are based on this criteria.
2. Bacteria. This refers to the presence of high levels of coliform, strep and enteric fecal organisms which cause the closure of waters to swimming and shellfishing.
3. Sediments. Soil erosion which results in high levels of turbidity.
4. Oil and Grease. Hydrocarbon pollution resulting from highway runoff, marina, and industrial areas. Their presence is evidenced as a sheen on the water surface.
5. Pesticides. These class of chemicals can be found in runoff from agricultural lands and some urban areas.
6. Other Chemicals. General category for other chemicals besides pesticides and oil and grease, typically associated with landfills, industrial land uses and hazardous waste sites.

7. Debris. This category includes trash ranging from Styrofoam plates and cups to yard clippings and dead animals.
8. Oxygen Depletion. Low levels of dissolved oxygen in the water column resulting in odor problems (anoxic waters) and fish kills.
9. Salinity. Changes in salinity caused by too much or too little freshwater inflows. Typical results are declines in the fishery and changes in species composition.
10. pH. Change in the acidity of surface waters with resultant declines in fisheries and other changes to flora and fauna, such as reductions in diversity or abundance.
11. Metals. Anthropogenically enriched levels of trace metals commonly associated with urbanized watersheds and marinas.
12. Habitat Alteration. Landuse activities which adversely affect the resident flora and fauna. Included with habitat alteration is habitat loss.
13. Flow Alteration. Landuse activities which influence the flow characteristics of a watershed resulting in adverse affects upon flora and fauna.
14. Thermal Pollution. Activity which changes local temperature of receiving water relative to ambient temperature.
15. Other Pollutants. General category used to describe activities and impacts not described in the other 14 categories.

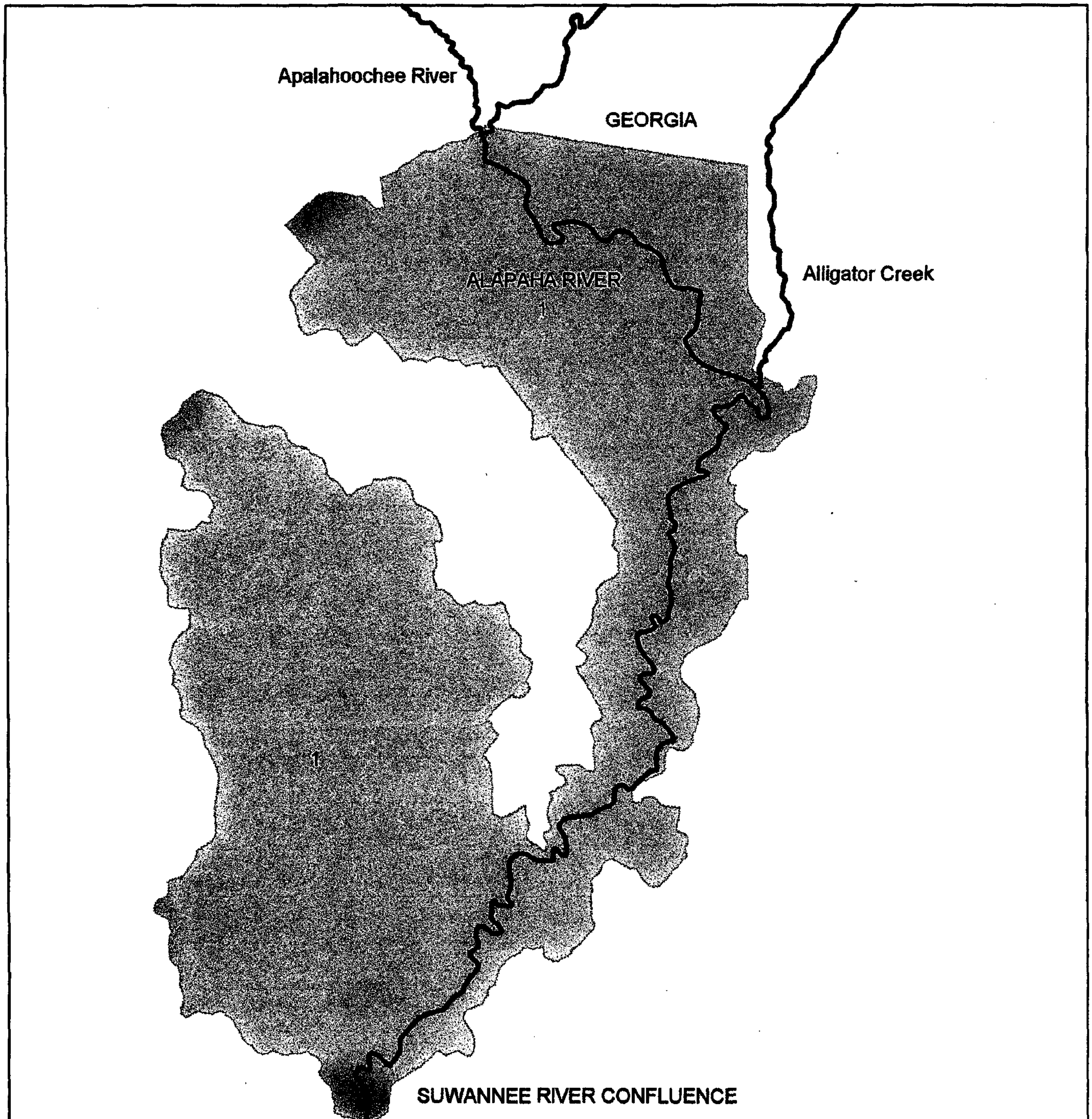
Responses of waterbodies to the above listed sources of pollutants were defined as symptoms. The nine symptoms used for categorization are defined as follows:

1. Fish Kills. Dead and dying fish caused by designated source of pollution.
2. Algal Blooms. Excessive growth of algae resulting from nutrient enrichment.
3. Aquatic Plants. Density of exotic and nuisance plants such that impairment of the waterbody occurs. Nutrient enrichment is usually the cause.
4. Turbidity. High suspended sediment loads in water column resulting from soil erosion. Effects on the waterbody include smothering of benthos and reduced light penetration with resultant loss of plant and algal productivity.
5. Odor. Unpleasant smells resulting from low dissolved oxygen conditions (anoxia) and or fish kills.
6. Declining Fisheries. Reduction in landings of or increases in catch per unit effort to catch game and commercial species indicating loss of productive fishery.
7. No Swimming. Closure of recreational swimming areas due to public health risks, usually caused by high coliform bacteria counts.
8. No Fishing. Closure of recreational or commercial fishing areas because of threats to human health from elevated bacteria counts or levels of contaminants.

9. Other Symptoms. General category used for information that cannot be placed in any other category.

Making Use Support Determinations

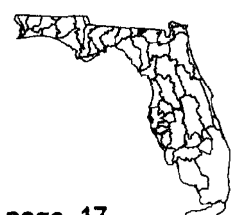
EPA has revised its criteria for determining the status of waters as documented in Appendix B of the Guidelines for the Preparation of the 1994 State Water Quality Assessments (305(b) Report). Often, a variety of assessment techniques were available for each watershed (e.g., chemical data, biological data and NPS survey results) and in this case a use decision was made based on integrating all the information. If quantitative data were available on the water quality of a waterbody (through the Trophic State Index or Water Quality Index) then the designated use of the waterbody was determined from the quantitative information, and if no quantitative data were available, then the qualitative NPS survey results were used to estimate designated use of the waterbody. Current data was available for assessment of about 1100 watersheds, historic data was used in 400 watersheds, and qualitative data was used in 1000 watersheds. The NPS survey provided all the information on sources of pollution (e.g. urban or construction runoff) and part of the information on causes and symptoms of pollution. Integrating the information from the quantitative (STORET) analysis and the qualitative NPS survey was not easy, but many additional watersheds were assessed based on the results of the integration. In the future, the two techniques should blend together much better through increased coordination of efforts.



ALAPAHA RIVER BASIN
03110202

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



ALAPAHA RIVER BASIN

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Basic Facts

Drainage Area: 1,840 square miles (about 5% in Florida)
Major Land Uses: forest, agriculture
Population Density: very low (Jasper)
Major Pollution Sources: all-terrain vehicle usage of river bed when dry, point sources in Georgia
Best Water Quality Areas: flow dependent
Worst Water Quality Areas: flow dependent
Water Quality Trends: stable trend at 1 site
OFW Waterbodies: none
SWIM Waterbodies: part of the Suwannee River SWIM Plan
Reference Reports:
  Suwannee River System SWIM Plan, SRWMD, 1991
  Alapaha River Basin Assessment, SFWMD, 1979
  Florida Rivers Assessment DEP/FREAC/NPS, 1989
Basin Water Quality Experts:
  Ron Ceyrak, SRWMD, 904/362-1001
  Homer Royals, FGFWFC, 904/357-6631
  Lee Banks, DEP (Jacksonville), 904/448-4300

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In the News

* A chicken rendering plant was proposed in Georgia near the Alapaha River. It was proposed that wastewater from the plant be sprayed on a 30 acre field 4000 feet from the river. Opponents have expressed concern that runoff would contaminate the river, however, there is no record of impacts to date.

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Ecological Characterization

The Alapaha River basin originates in Georgia and terminates at the Suwannee River north of the Town of Live Oak in Florida. The basin drains 1840 square miles (376 river miles) of which 100 (18 river miles) are in Florida. The Florida portion of the basin is mostly forest and agricultural land.

In Georgia, the river is mostly blackwater with some alluvial runoff. After entering Florida, it flows into a karst terrain where it is captured by sinkholes during low flow (about half the time). It re-emerges near its confluence with the Suwannee River, most probably as Alapaha Rise Spring or Holton Springs. The underground and groundwater connections buffer the Alapaha to a near-neutral pH. The River contributes an annual average of 15% of the annual flow to the Suwannee River.

Anthropogenic Impacts

Point sources of pollution to the river located in Georgia are the Cities of Alapaha, Fitzgerald, and Lakeland WWTPs. Within Florida, the City of Jasper WWTP discharges into a tributary, Bell Creek, of the river. The Alapaha River appears to have good water quality in the Florida reach. It flows through rural areas of low intensity agriculture and silviculture. There may be significant habitat impacts since at low flow the dry or semi-dry riverbed is a favorite area for all-terrain vehicle use.

The river has been monitored since 1989 by SRWMD as a SWIM priority water. The sampling station is located below the river's confluence with the Alapahoochee River near the Town of Jennings.

** USGS HYDROLOGIC UNIT: 03110202 ALAPAHA RIVER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED		WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
ID	NAME	MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: STREAM																												
1	ALAPAHA RIVER	46	89	93	Current	5.3	0.8	140	5	7.7	82	1.0	.	15	5.9	5	0.98	0.18	1	185	.	.	.	.	56	.	38	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110202 ALAPAHA RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: STREAM																
1	ALAPAHA RIVER	GOOD	Current	0	0	.	0	x	0	0	0	0	0	.	0	0

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03110202 ALAPAHA RIVER

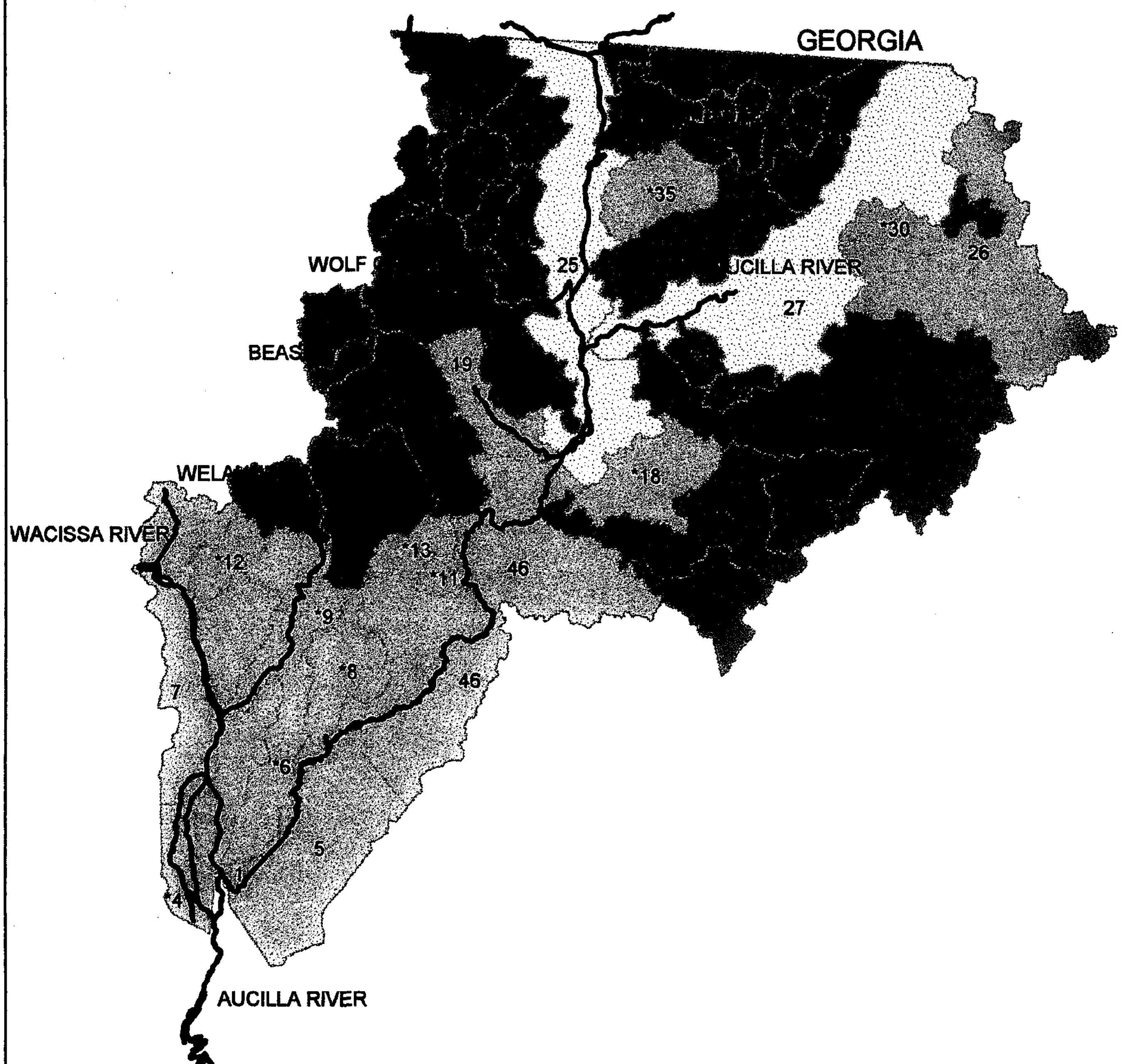
'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK MEETS USE ?	QUALITY RANK WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: STREAM																						
1	ALAPAHA RIVER	YES	GOOD	0	0	0	0	.	x	0	0	0	0	.	0	0	0	.	.	+	.	

LEGEND:

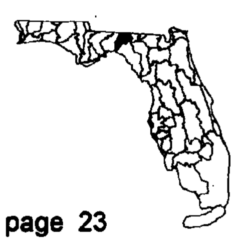
ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS



AUCILLA RIVER BASIN
03110103

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



AUCILLA RIVER BASIN

Basic Facts

Drainage Area: 850 square miles (about 733 square miles in Florida)
Major Land Uses: silviculture, agriculture
Population Density: very low
Major Pollution Sources: silviculture, cattle access to Wacissa
Best Water Quality Areas: Aucilla and Wacissa River
Worst Water Quality Areas: Little Aucilla
Water Quality Trends: stable quality at 3 sites and improving quality on Lower Aucilla
OFW Waterbodies: Wacissa River, Aucilla River
SWIM Waterbodies: Coastal Rivers
Reference Reports:
Aucilla River System SWIM Plan, SRWMD, 1990
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
Aucilla River System SWIM Plan, SRWMD, 1991
Basin Water Quality Experts:
Gray Bass, FGFWFC, 904/957-4172
Homer Royals, FGFWFC, 904/357-6631
Lee Banks, DEP (Jacksonville) 904/448-4300

Ecological Characterization

The Aucilla River is an exceptional jewel among Florida's rivers. The Aucilla River and its main tributary, the Wacissa River, are designated Outstanding Florida Waters. Originating in Georgia, the blackwater Aucilla flows approximately 69 miles to the Gulf of Mexico and drains 733 square miles of northern Florida. The headwaters are a series of lakes, swamps, sinkholes and underground passages that eventually coalesce into a defined channel. Water quality is characterized by tea-colored water due to natural humic substances. This stretch of the river is a favorite of canoeists as it offers some of Florida's rare river rapids. The river goes underground and, for about 2 miles, is evident only as a series of sinkholes until it reappears about 5 miles downstream in a swampy area around Nutall Rise.

The Wacissa River originates from several springs about 15 miles southeast of Tallahassee. This stream runs clear during periods of low rainfall, but becomes tannic during rainy times. It flows through an area abounding in wildlife and diverse vegetation. After about 12 miles, the Wacissa begins to diverge into several braided channels that form a maze of surface and underground passages eventually emptying into the Aucilla near where it emerges. A shallow canal built by Indians and rebuilt by slaves (in the early 19th century) provides canoe passage to the Aucilla River through virtually untouched floodplain and swamps.

Both the Aucilla and Wacissa are rich in archaeological sites, including prehistoric fossil records and evidence of early Indian settlements. Both river corridors are refuge to many rare and endangered species. Most of the drainage area is in silviculture, and much of the river corridor area is in public ownership.

The mouth of the Aucilla empties into an expanse of Spartina saltmarsh adjoining the St. Marks National Wildlife Refuge.

Anthropogenic Impacts

The water quality of the river is currently being monitored by DEP. It was previously sampled in 1987 as part of a Basin Assessment. An integrated comprehensive investigation of water quality and biological resources has not been performed. Water quality appears to be very good in this basin. There are few pollution sources and relatively low impact land uses. The upper reaches of the Aucilla River and the Little Aucilla River are swampy and have little flow. They are naturally low in pH and dissolved oxygen. Consequently, biological diversity is low especially in the Little Aucilla. However, after the stream coalesces into a defined stream, and its flow supplemented by groundwater, biological diversity improves (near Lamont). All reaches below this area normally have levels of pH and DO consistent with unpolluted flowing streams.

Although still supporting healthy populations of native aquatic plants, the Wacissa does periodically have areas clogged with Hydrilla and water hyacinth. Also, near where the Wacissa becomes diffuse before reaching the Aucilla, there is an area where cattle have direct access to the water.

** USGS HYDROLOGIC UNIT: 03110103 AUCILLA RIVER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED		WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
ID	NAME	MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: LAKE																												
26	DEVILS WOODYARD SLOUGH	3	80	80	Historical	.	.	15	.	.	.	.	.	.	6.7	9	0.51	0.01	4	.	.	.	.	.	28	.	.	31
* WATER BODY TYPE: STREAM																												
1	AUCILLA RIVER	30	91	93	Current	0.7	.	65	3	7.0	67	1.1	.	.	7.3	135	0.35	0.04	.	680	74	.	.	.	295	.	25	.
5	AUCILLA RIVER	53	78	86	Historical	1.3	.	.	.	7.0	72	.	.	17	7.0	57	0.76	0.06	.	.	36	.	.	.	103	422	28	.
7	WACISSA RIVER	63	71	75	Historical	1.7	.	5	2	6.6	72	0.3	.	3	7.8	146	0.17	0.05	.	1120	145	.	.	.	319	372	25	.
19	RAYSOR CREEK	18	71	74	Historical	2.2	.	358	4	3.6	39	0.7	101	.	3.6	0	.	0.11	.	117	35	.	.	.	75	.	44	.
25	AUCILLA RIVER	25	91	93	Current	1.7	0.5	225	6	4.0	45	1.5	.	.	5.0	2	1.09	0.03	.	355	60	.	.	.	43	.	46	.
27	LITTLE AUCILLA RIVER	44	91	93	Current	1.1	0.3	325	5	2.2	24	2.0	.	.	4.2	1	1.51	0.04	.	550	43	.	.	.	51	.	50	.
46	AUCILLA RIVER	43	91	93	Current	1.6	0.9	115	4	6.2	67	1.4	.	.	7.2	89	0.53	0.03	.	380	60	3.0	3.6	11	153	.	35	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
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FECL-FECAL COLIFORM MPN/100ML
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MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110103 AUCILLA RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK (WQI OR TSI)	DATA RECORD (CURRENT OR HISTORICAL)	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
			SCREENING VARIABLES AND CRITERIA	TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: LAKE																
26	DEVILS WOODYARD SLOUGH	GOOD	Historical	0	.	0	0	x	.	.	.	.	.	.	0	.
* WATER BODY TYPE: STREAM																
1	AUCILLA RIVER	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	.	.
5	AUCILLA RIVER	GOOD	Historical	0	0	.	0	0	0	.	0	0	0	.	.	.
7	WACISSA RIVER	GOOD	Historical	0	0	.	0	0	0	.	0	0	0	.	.	.
19	RAYSOR CREEK	GOOD	Historical	.	0	.	x	x	0	.	0	x	0	.	.	.
25	AUCILLA RIVER	FAIR	Current	0	0	.	x	x	0	.	0	0	0	.	.	x
27	LITTLE AUCILLA RIVER	FAIR	Current	0	0	.	x	x	0	.	0	x	0	.	.	x
46	AUCILLA RIVER	GOOD	Current	0	0	.	0	0	0	.	0	0	0	0	.	0

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03110103 AUCILLA RIVER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

<--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	1984 - 1993 TRENDS: OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: LAKE																						
26	DEVILS WOODYARD SLOUGH	YES	GOOD																			
* WATER BODY TYPE: STREAM																						
1	AUCILLA RIVER	YES	GOOD	+	0	0	+	.	.	0	0	+	0	0	.	0	0	0	0	0	.	
5	AUCILLA RIVER	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	WACISSA RIVER	YES	GOOD																			
19	RAYSOR CREEK	YES	GOOD																			
25	AUCILLA RIVER	PARTIAL	FAIR	0	0	0	+	.	x	0	x	+	0	0	.	0	0	0	0	0	.	
27	LITTLE AUCILLA RIVER	PARTIAL	FAIR	0	0	0	0	.	0	0	0	+	0	0	.	0	0	0	0	0	.	
46	AUCILLA RIVER	YES	GOOD	0	0	0	+	.	0	0	0	0	x	0	.	0	0	0	+	+	.	

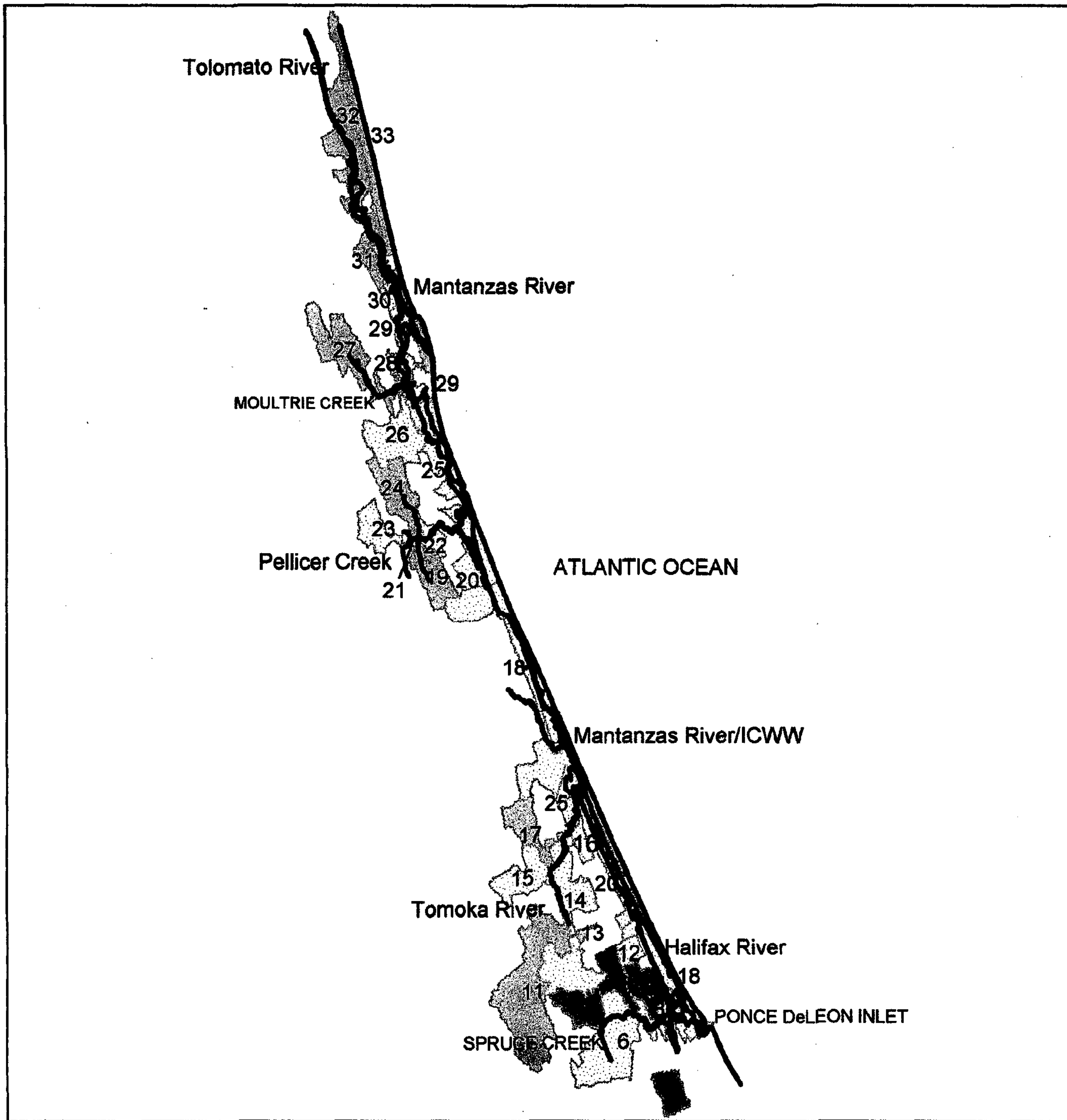
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=AUCILLA RIVER HUC=03110103

MAP ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WBED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RB	SL	LD	UR	CN	HM	OT
1	3424A	AUCILLA RIVER	GOOD	GOOD																																		
1	3424A	AUCILLA RIVER	GOOD	GOOD																																		
1	3424A	AUCILLA RIVER	GOOD	GOOD																																		
4*	3505	THE SLAVE CANAL		GOOD																																		
5	3310B	AUCILLA RIVER	GOOD	THREAT	X		X	X	X												X		X	X	X						X		X		X	X		X
6*	3470	COW CREEK		GOOD																																		
7	3424	WACISSA RIVER	GOOD	GOOD																																		
8*	3453	JONES MILL CREEK		GOOD																																		
9*	3436	WELAUNEE CREEK		GOOD																																		
10*	3440	UNNAMED BRANCH		THREAT	X				X																						X							
11*	3442	UNNAMED DRAIN		GOOD																																		
12*	3428	LITTLE RIVER		GOOD																																		
13*	3430	ANDERSON BAY DRAIN		GOOD																																		
14*	3412	ALLIGATOR CREEK		THREAT	X																										X		X					
15*	3407	UNNAMED DRAIN		THREAT			X				X																						X					
16*	3417	SUNDOWN CREEK		THREAT	X				X																						X	X	X					
17*	3419	BAILEY MILL CREEK		THREAT	X			X	X																						X		X		X	X	X	
18*	3403	ROCKY CREEK		GOOD																																		
19	3377	RAYSOR CREEK	GOOD	THREAT			X				X																				X		X					
20*	3369	HIXTOWN SWAMP		THREAT							X					X															X		X					X
21*	3367	BEASLEY CREEK		THREAT			X				X																						X					
22*	3382	UNNAMED DRAIN		THREAT			X			X																					X		X	X	X			
23*	3379	MILL POND CREEK		THREAT				X																									X		X			
24*	3373	UNNAMED DITCH		THREAT	X		X	X	X																						X		X	X	X	X		X
25	3310C	AUCILLA RIVER	FAIR	THREAT	X		X	X	X												X		X	X	X						X		X		X	X		X
26	3329	DEVILS WOODYARD SLOUGH	GOOD	THREAT	X		X	X	X																						X		X	X	X			X
27	3314	LITTLE AUCILLA RIVER	FAIR	THREAT	X		X	X	X																						X		X	X	X			X
28*	3337	WOLF CREEK		THREAT	X				X							X															X			X				X
29*	3348	JUNE POND OUTLET		THREAT	X				X																						X		X					
30*	3356	UNNAMED SLOUGH		GOOD																																		
31*	3311	GUM CREEK		THREAT	X	X	X		X																						X	X	X	X				X
32*	3349	MILE POND OUTLET		THREAT	X		X									X							X								X		X	X			X	X
33*	3352	SILVER LAKE OUTLET		THREAT	X																										X							
34*	3355	SIMPSON LAKE OUTLET		THREAT	X		X	X	X												X			X										X	X	X		X
35*	3344	UNNAMED SLOUGH		GOOD																																		
36*	3313	UNNAMED SLOUGH		THREAT	X		X		X																						X		X					X
37*	3335	UNNAMED BRANCH		THREAT	X		X		X																						X			X			X	X
38*	3339	UNNAMED OUTLET		THREAT	X		X		X																						X						X	
39*	3326	SHEHEE LAKE OUTLET		THREAT	X				X																						X			X				
40*	3320	UNNAMED SLOUGH		THREAT	X				X																						X		X					
41*	3316	UNNAMED SLOUGH		THREAT	X				X																						X							
42*	3317	UNNAMED SLOUGH		THREAT	X				X																						X							
43*	3312	BLUE POND DRAIN		THREAT	X				X																						X							
44*	3309	UNNAMED BRANCH		THREAT	X				X																						X							
45*	3310D	MCMULLEN BAY		THREAT	X		X	X	X												X		X	X	X						X		X		X	X		X
46	3310	AUCILLA RIVER	GOOD	THREAT	X		X	X	X												X		X	X	X						X		X		X	X		X



UPPER EAST COAST BASIN
03080201

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN

UPPER EAST COAST BASIN

Basic Facts

Drainage Area: 730 square miles
Major Land Uses: urban, wetlands, forest
Population Density: moderately high (Daytona Beach, Ormond Beach, St. Augustine)
Major Pollution Sources: urban runoff, WWTP
Best Water Quality Areas: Matanzas River, Casa Cola Cr.
Worst Water Quality Areas: B-19 Canal
Water Quality Trends: stable quality at 11 sites, declining quality in Palm Court, improving in Casa Cola Cr. and Halifax River near Marineland
OFW Waterbodies:
Tomoka Marsh State Aquatic Preserve, Tomoka River
Pellicer Creek State Aquatic Preserve, Spruce Creek
SWIM Waterbodies: none
Reference Reports:
Coastal Area BAS, DEP (Jacksonville), 1987
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
Biological Assessment of St. Augustine WWTP #2, July, 1993, DEP
Biological Assessment of City of Flagler Beach WWTP, April, 1993, DEP
Basin Water Quality Experts:
John Hendrickson, SJRWMD, 904/329-4370
Lee Banks, Jim Wright, DEP (Jacksonville), 904/448-4300
Guy Hadley, DEP (Orlando), 407/894-7555

Ecological Characterization

The Upper East Coast basin starts just south of Jacksonville and extends south to New Smyrna Beach. The basin consists of a narrow strip of coastal ridge separating the Atlantic Ocean from a narrow lagoon system and the mainland. These lagoons, called "rivers", connect to the ocean by three inlets and to each other through the Intracoastal Waterway. The three major estuarine "rivers" are the Tolomato River to the north (from St. Augustine to Jacksonville), the Matanzas River in the middle (ICWW from St. Augustine Inlet to Matanzas Inlet), and the Halifax River in the south. The Guana River is another lagoon roughly parallel and seaward of the Tolomato and connected to the Tolomato near the St. Augustine inlet. However, it is not part of the Intracoastal Waterway.

The majority of the watersheds in this basin are drained by relatively small creeks into the lagoons. In the northern basin, the Moultrie Creek drainage area and the Pellicer Creek watershed are dominated by forest land, but also have significant amounts of wetlands. The Tomoka River, in the southern portion of the basin, drains wetlands. Both sub-basins have some agricultural drainage through inland canals. Urban areas in the basin include St. Augustine, Ormond Beach, Daytona Beach and several other smaller communities. Increased development in certain areas, such as Palm Coast and Palm Valley in Ponte Vedra, could adversely influence the Intercoastal Waterway and their respective areas.

Anthropogenic Impacts

A basin assessment of the East Coast Basin performed by district personnel indicated major water quality problems in the Halifax River between Ormond Beach and Daytona Beach. There are elevated nutrient concentrations and excessive turbidity in the area due to urban runoff and effluent from several municipal WWTPs which have a combined discharge of about 30 MGD. There is suspected oil and grease contamination in this area from the numerous auto service businesses along the river. Maintenance dredging of the ICWW resuspends sediments and their associated nutrients, metals and oxygen demanding substances. Finally, there are six causeway bridges which act as physical obstructions and serve to compartmentalize the pollution and decrease circulation. A wasteload allocation study of the Halifax River based on water quality data and tidal measurements recommended that advanced wastewater treatment was necessary in order to prevent further degradation. The WWTPs are in the process of, or have agreed to upgrade treatment levels and make further investigation into re-use possibilities. Additionally, the Port Orange Causeway has been modified to allow for better circulation of the southern Halifax.

Other areas in the basin which show borderline good-fair water quality are Spruce Creek and Tomoka River. Both receive agricultural runoff, and the lower Tomoka also gets airport runoff. Attempts are under way in these areas to improve the quality of stormwater runoff through the use of treatment basins. A DEP basin assessment found both creeks to have a relatively good biological community. The Nonpoint Source Assessment indicates the Moultrie Creek and Pellicer Creek, in the northern portion of the basin, are degraded by construction and urban runoff.

The ICWW from Jacksonville Beach to south of Flagler Beach was the subject of a past basin assessment. The Matanzas River around St. Augustine is affected by urban runoff, WWTPs, port activities. The river exhibits elevated nutrient concentrations and some metals contamination problems. The Matanzas, and Tolomato Rivers are classified for shellfish harvesting, but are closed to shellfishing.

** USGS HYDROLOGIC UNIT: 03080201 EAST COAST, UPPER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	WATERSHED NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: ESTUARY																												
1	ICWW	48	89	93	Current	4.4	1.2	19	16	5.9	71	1.3	.	.	7.8	115	0.61	0.08	3	39	3	3.5	.	.	41825	.	.	48
2	MATANZAS RIVER	95	90	93	Current	5.7	0.9	24	29	6.0	70	1.1	.	1	7.8	116	0.67	0.08	7	59	15	2.9	.	.	46725	.	.	53
3	MATANZAS RIVER	21	90	92	Current	3.6	1.6	10	14	6.7	78	1.2	.	.	8.1	115	0.53	0.18	.	13	7	3.1	.	.	45575	.	.	43
4	MATANZAS RIVER	135	90	93	Current	4.4	1.0	50	20	6.2	68	1.3	.	.	7.6	110	0.79	0.10	.	111	12	3.6	.	.	38725	.	.	58
8	ROSE BAY	72	91	93	Current	5.7	0.6	38	26	6.7	72	.	.	.	7.6	.	1.23	0.16	11	179	75	.	.	.	27700	.	.	56
18	Halifax River	415	89	93	Current	5.7	1.3	23	14	7.1	78	1.6	.	2	7.9	113	1.10	0.14	7	40	23	.	.	.	44875	.	.	55
20	Halifax River	321	89	93	Current	8.5	0.9	38	20	7.1	77	1.8	.	.	7.7	113	1.20	0.13	7	30	13	.	.	.	37265	.	.	56
25	TOMOKA BASIN	32	92	93	Current	6.8	0.9	46	20	7.0	75	1.3	.	.	7.5	125	1.30	0.09	5	21	16	.	.	.	35688	.	.	54
29	PALM COAST	186	89	93	Current	7.6	0.9	36	20	6.3	70	1.4	.	.	7.5	118	0.81	0.11	4	75	15	2.6	.	.	41625	.	.	54
30	ROBINSON CREEK	30	90	93	Current	3.2	1.6	23	17	6.7	75	1.3	.	.	8.1	113	0.56	0.08	.	7	6	.	.	.	44000	.	.	51
31	CASA COLA CREEK	18	89	90	Current	6.9	1.4	28	38	5.8	62	1.0	.	1	7.5	106	0.34	0.06	5	7	.	.	.	.	48638	.	.	39
32	ICWW	124	89	93	Current	6.4	1.0	31	33	6.2	72	1.2	.	2	7.5	112	0.57	0.07	5	46	4	.	.	.	43875	.	.	49
33	GUANO RIVER	12	89	90	Current	7.4	1.3	31	50	5.3	61	1.7	.	3	7.2	101	0.66	0.10	8	.	.	.	.	.	46900	.	.	49
* WATER BODY TYPE: LAKE																												
28	SALT RUN	6	90	90	Current	3.6	1.1	15	15	5.8	65	1.6	.	.	8.0	120	0.23	0.36	.	13	.	.	.	.	50000	.	.	42
* WATER BODY TYPE: STREAM																												
6	SPRUCE CREEK	199	89	93	Current	4.7	0.6	100	10	5.4	59	.	.	10	7.2	159	1.23	0.13	4	185	103	.	.	.	5385	1	46	.
10	UNNAMED DITCH	13	83	84	Historical	.	.	158	.	4.5	56	.	.	.	7.2	.	1.75	0.26	.	.	.	.	.	.	356	8	67	.
11	THAYER CANAL	13	83	84	Historical	.	.	243	.	3.3	39	.	.	.	5.7	.	0.85	0.04	.	.	.	.	.	.	85	1	44	.
13	UNNAMED DITCH	6	83	84	Historical	.	.	99	.	4.6	56	.	.	.	7.0	.	0.55	0.04	.	.	.	.	.	.	328	0	33	.
14	TOMOKA RIVER	59	89	93	Current	4.7	0.8	143	8	5.7	60	1.8	.	.	7.3	125	1.15	0.09	4	260	105	.	.	.	15723	.	52	.
15	LITTLE TOMOKA RIVER	34	85	86	Historical	7.3	0.4	314	7	4.8	53	1.8	.	.	6.8	44	1.39	0.05	2	.	.	.	.	.	5278	.	55	.
16	UNNAMED BRANCH	20	85	86	Historical	5.7	0.5	223	9	4.3	50	1.6	.	.	7.1	64	1.27	0.11	6	.	.	.	.	.	7325	.	54	.
17	GROVER BRANCH	7	85	86	Historical	6.0	0.4	160	5	5.0	53	0.9	.	.	7.0	39	0.97	0.05	1	.	.	.	.	.	200	.	38	.
19	HULETT BRANCH	3	92	92	Current	2.0	0.5	150	1	6.0	63	.	.	15	6.1	76	0.34	0.11	1	.	250	.	.	.	310	.	42	.
21	Pellicer Creek	3	92	92	Current	3.0	0.2	600	2	6.3	64	.	.	62	6.3	43	1.71	0.17	0	.	64	.	.	.	170	.	51	.
22	Pellicer Creek	24	89	93	Current	2.2	0.3	450	2	4.0	46	1.2	.	29	6.7	59	1.09	0.08	1	.	687	.	.	.	505	.	54	.
23	STEVENS BRANCH	4	92	92	Current	2.5	0.4	700	1	7.1	71	.	.	55	6.4	57	1.44	0.14	0	.	65	.	.	.	280	.	46	.
24	CRACKER BRANCH	5	92	93	Current	1.5	0.3	430	2	6.8	67	.	.	45	5.2	16	1.14	0.05	0	.	93	.	.	.	150	.	43	.
26	MOSES CREEK	3	89	89	Current	3.2	.	600	6	4.2	45	1.3	.	.	7.1	63	1.60	0.09	0	.	.	.	.	.	320	.	53	.
27	MOULTRIE CREEK	33	70	80	Historical	1.0	.	130	4	4.9	56	1.0	.	19	6.5	52	0.74	0.15	.	.	.	.	.	.	317	2	43	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT ** USGS HYDROLOGIC UNIT: 03080201 EAST COAST, UPPER
MEDIAN VALUES FOR EACH WATERSHED SCREENED

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN TN>2.0	STREAM TP TP>.46	LAKE TP TP>.12	PH PH>8.8 PH<5.2	ALK ALK<20	TURB & TSS TURB>16.5 TSS>18	COND COND>1275	OXYGEN DEMAND BOD>3.3 COD>102 TOC>27.5	DO DO<4	COLIFORM BACTI TOT>3700 FECAL>470	BIOL DIV DIART<1.95 DINAT<1.5 BECK<5.5	CHLA CHLA>40	SECCHI DISC SD<.7
* WATER BODY TYPE: ESTUARY																
1	ICWW	GOOD	Current	0	.	0	0	0	0	x	0	0	0	0	0	0
2	MATANZAS RIVER	FAIR	Current	0	.	0	0	0	x	x	0	0	0	0	0	0
3	MATANZAS RIVER	GOOD	Current	0	.	x	0	0	0	x	0	0	0	0	.	0
4	MATANZAS RIVER	FAIR	Current	0	.	0	0	0	x	x	0	0	0	0	.	0
8	ROSE BAY	FAIR	Current	0	.	x	0	.	x	x	.	0	0	.	0	x
18	Halifax River	FAIR	Current	0	.	x	0	0	0	x	0	0	0	.	0	0
20	Halifax River	FAIR	Current	0	.	x	0	0	x	x	0	0	0	.	0	0
25	TOMOKA BASIN	FAIR	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
29	PALM COAST	FAIR	Current	0	.	0	0	0	x	x	0	0	0	0	0	0
30	ROBINSON CREEK	FAIR	Current	0	.	0	0	0	0	x	0	0	0	.	.	0
31	CASA COLA CREEK	GOOD	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
32	ICWW	GOOD	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
33	GUANO RIVER	GOOD	Current	0	.	0	0	0	x	x	0	0	.	.	0	0
* WATER BODY TYPE: LAKE																
28	SALT RUN	GOOD	Current	0	.	x	0	0	0	x	0	0	0	.	.	0
* WATER BODY TYPE: STREAM																
6	SPRUCE CREEK	FAIR	Current	0	0	.	0	0	0	x	0	0	0	.	0	x
10	UNNAMED DITCH	POOR	Historical	0	0	.	0	.	.	.	.	0	.	.	.	.
11	THAYER CANAL	GOOD	Historical	0	0	.	0	.	.	.	.	x	.	.	.	.
13	UNNAMED DITCH	GOOD	Historical	0	0	.	0	.	.	.	.	0	.	.	.	.
14	TOMOKA RIVER	FAIR	Current	0	0	.	0	0	0	x	0	0	0	.	0	0
15	LITTLE TOMOKA RIVER	FAIR	Historical	0	0	.	0	0	0	x	0	0	.	.	0	x
16	UNNAMED BRANCH	FAIR	Historical	0	0	.	0	0	0	x	0	0	.	.	0	x
17	GROVER BRANCH	GOOD	Historical	0	0	.	0	0	0	0	0	0	.	.	0	x
19	HULETT BRANCH	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
21	Pellicer Creek	FAIR	Current	0	0	.	0	0	0	.	x	0	0	.	0	x
22	Pellicer Creek	FAIR	Current	0	0	.	0	0	0	0	x	0	x	.	0	x
23	STEVENS BRANCH	FAIR	Current	0	0	.	0	0	0	.	x	0	0	.	0	x
24	CRACKER BRANCH	GOOD	Current	0	0	.	0	x	0	.	x	0	0	.	0	x
26	MOSES CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	.	.	0	.
27	MOULTRIE CREEK	GOOD	Historical	0	0	.	0	0	0	.	0	0	.	.	.	.

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03080201 EAST COAST, UPPER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	MEETS USE ?	WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
1	ICWW	YES	GOOD	0	0	0	0	0	0	0	.	+	+	x	.	0	0	0	0	0	.	
2	MATANZAS RIVER	PARTIAL	FAIR	0	x	x	+	0	0	+	.	+	x	0	.	0	x	0	0	0	.	
3	MATANZAS RIVER	YES	GOOD	0	0	0	0	.	0	0	.	+	0	0	.	0	0	+	.	0	.	
4	MATANZAS RIVER	PARTIAL	FAIR	0	x	x	+	.	0	0	.	+	x	0	.	0	+	0	+	0	.	
8	ROSE BAY	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
18	Halifax River	PARTIAL	FAIR	0	0	x	+	0	+	0	.	0	0	.	.	+	+	.	.	0	.	
20	Halifax River	PARTIAL	FAIR	+	+	x	+	+	+	x	+	+	0	0	.	0	0	.	.	0	.	
25	TOMOKA BASIN	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
29	PALM COAST	PARTIAL	FAIR	x	x	0	0	x	0	0	+	+	0	0	.	0	0	0	0	0	.	
30	ROBINSON CREEK	PARTIAL	FAIR	0	0	0	0	.	0	0	.	0	0	0	.	0	0	0	0	0	.	
31	CASA COLA CREEK	YES	GOOD	+	+	+	0	0	0	0	0	+	0	0	.	0	0	.	.	0	.	
32	ICWW	YES	GOOD	0	0	0	0	0	0	0	0	+	0	x	.	0	0	+	+	0	.	
33	GUANO RIVER	YES	GOOD	0	0	0	0	+	0	0	0	+	0	0	.	0	0	.	.	0	.	
* WATER BODY TYPE: LAKE																						
28	SALT RUN	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
6	SPRUCE CREEK	PARTIAL	FAIR	0	0	+	x	.	.	0	0	x	.	.	.	0	0	.	+	0	0	
10	UNNAMED DITCH	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
11	THAYER CANAL	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
13	UNNAMED DITCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
14	TOMOKA RIVER	PARTIAL	FAIR	0	0	0	0	0	+	0	+	0	0	x	.	0	0	.	.	0	.	
15	LITTLE TOMOKA RIVER	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	UNNAMED BRANCH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
17	GROVER BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
19	HULETT BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
21	Pellicer Creek	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
22	Pellicer Creek	PARTIAL	FAIR	0	x	0	0	0	.	0	0	0	0	0	.	0	0	.	.	0	.	
23	STEVENS BRANCH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
24	CRACKER BRANCH	YES	GOOD	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
26	MOSES CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	
27	MOULTRIE CREEK	YES	GOOD																			

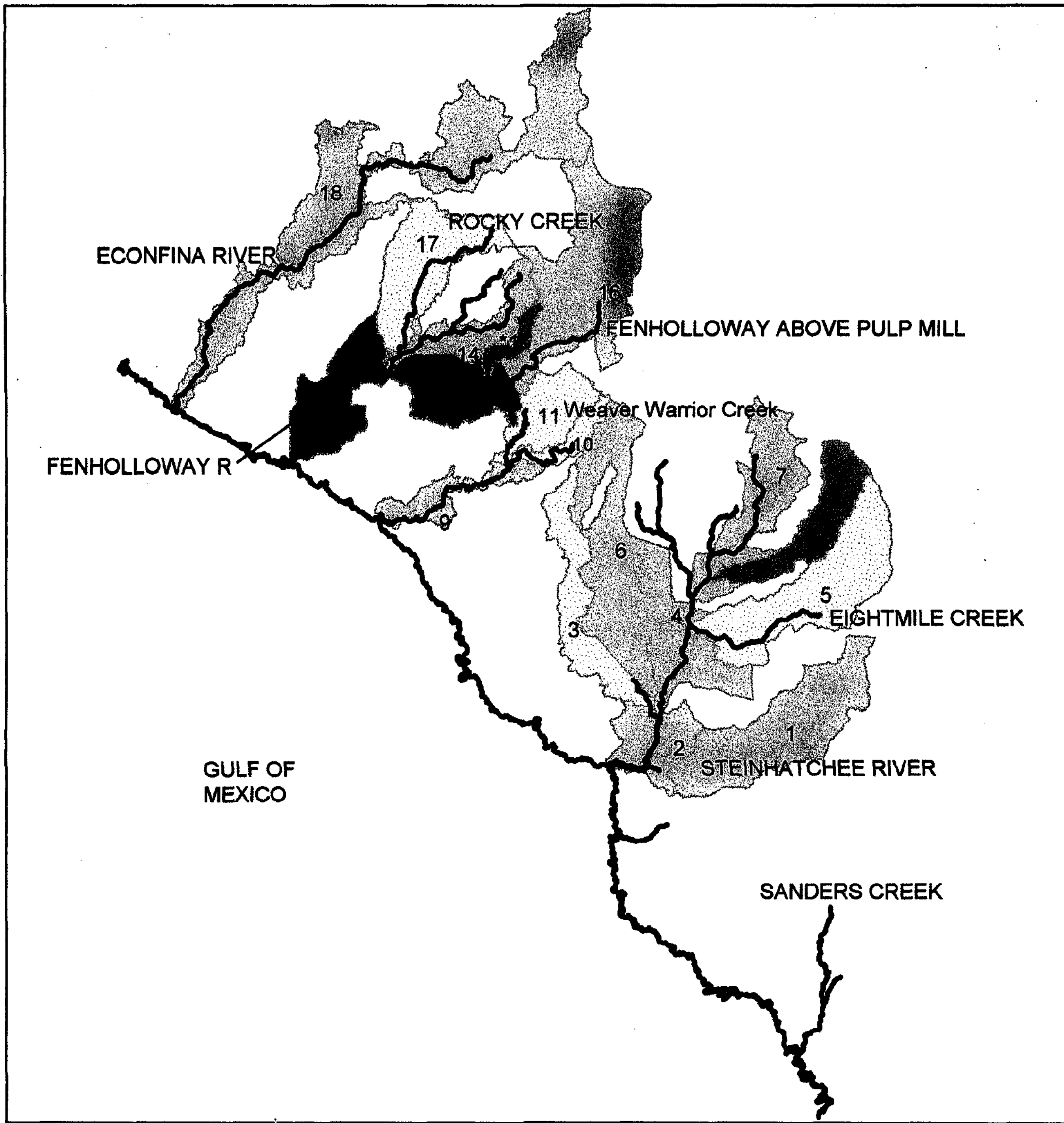
LEGEND:

	DOSAT-DO SATURATION	TCOLI-TOTAL COLIFORM	TURB-TURBIDITY
	FCOLI-FECAL COLIFORM	TEMP-TEMPERATURE	TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
ALK-ALKALINITY	FLOW-FLOW	TN-NITROGEN	WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS
BOD-BIOCHEM. OXYGEN DEMAND	MEETS USE-MEETS DESIGNATED USE	TOC-T.ORGANIC CARBON	
CHLA-CHLOROPHYLL	PH-PH	TP-PHOSPHORUS	
DO-DISSOLVED OXYGEN	SD-SECCHI DISC METERS	TSS-TOTAL SUSPENDED SOLIDS	

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=EAST COAST, UPPER HUC=03080201

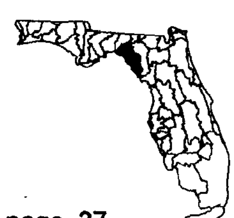
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
5*	2683	TURNBULL CREEK		THREAT	X	X	X					X	X			X	X					X	X		X						X			X	X	X	X	X
6	2674	SPRUCE CREEK	FAIR	FAIR	X	X	X	X		X		X	X				X			X	X	X	X	X	X						X			X	X	X	X	
7*	2673	UNNAMED DRAIN		THREAT	X	X	X			X		X	X			X	X				X	X	X		X						X		X	X	X	X	X	
8	2672	ROSE BAY	FAIR	FAIR	X	X	X	X			X	X	X		X		X			X	X		X		X									X	X	X	X	X
9*	2670	HALIFAX CANAL		THREAT	X	X	X	X		X	X	X	X		X	X	X				X		X		X									X	X	X	X	X
10	2666	UNNAMED DITCH	POOR	FAIR	X	X	X					X	X							X	X	X	X		X									X	X	X	X	
12*	2664	REES CANAL		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X									X	X	X		X
14	2634	TOMOKA RIVER	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X				X	X	X	X	X	X						X			X	X	X	X	X



ECONFINA CREEK/STEINHATCHEE RIVER BASIN
03110102

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
GOOD
THREATENED
FAIR
POOR
UNKNOWN



ECONFINA/FENHOLLOWAY/STEINHATCHEE RIVER BASIN

Basic Facts

Drainage Area: 1,127 square miles
Major Land Uses: wetlands, forest
Population Density: low (Steinhatchee, Perry, Mayo, Cross City)
Major Pollution Sources: pulp mill, silviculture practices
Best Water Quality Areas: Sand Hill Creek, Econfina River
Worst Water Quality Areas: Fenholloway River
Water Quality Trends: stable quality at 4 sites, improving trends at Econfina, and Steinhatchee River
OFW Waterbodies: Big Bend Seagrasses State Aquatic Preserve
SWIM Waterbodies: Steinhatchee River, Econfina R, Fenholloway R
Reference Reports:
Coastal Rivers Basin SWIM Plan
Steinhatchee River Basin Assessment (Interim Report), SRWMD, 1989
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
Watershed Management Efforts in the Steinhatchee River Basin, (Draft) Mattson, SRWMD, Florida Water Management Conference, 1992.
Basin Water Quality Experts:
Rob Mattson, SRWMD, 904/362-1001
Lee Banks, DEP (Jacksonville), 904/448-4300
David Heil, FDEP, 904/488-5471
Greg Maidhoff, Citrus County Planning, 904/746-4223
Gray Bass, FGFWFC, 904/957-4172

In the News

* The Fenholloway River (a Class V waterbody) receives pulp mill effluents and exhibits very poor water quality.
* Well contamination was reported in 1989 along the Fenholloway River du to dry weather conditions and percolation from the Fenholloway River and has been under investigation since then.
* A Use Attainability Analysis of possibly upgrading the Fenholloway River classification is being performed.
* Residents near the Fenholloway River have been given bottled water because of well contamination from the Fenholloway River.
* As a result of a interagency study in Spring 1992, the timber agency has undertaken drainage retrofitting in the Steinhatchee Basin.
* Horseshoe Beach, Dekle Beach and the Town of Steinhatchee were badly damaged by a major winter storm, known as the storm of the century, that occurred in March of 1993.

Ecological Characterization

This coastal lowlands basin in Florida's Big Bend area includes several small river systems: the Econfina River, the Fenholloway River, Spring Warrior Creek, the Steinhatchee River, and Sanders Creek. These small rivers drain swampy lowlands and empty into salt marsh estuaries at the Gulf of Mexico.

Some of these rivers are characterized as acidic blackwaters flowing over a sandy and limestone substrate, but a number of these receive groundwater input. Some karst features are evident such as limestone outcroppings and some small springs. Both the Steinhatchee and Econfina Rivers are captured by sinkholes at normal to low flows. The Fenholloway is partially captured by sinks as are some of the smaller tributaries.

The basin's uplands are almost entirely in silviculture. There are extensive swampy wetlands around the river's drainage areas, and the basin's coastal margins are belted by salt marshes. There is little urban development in the basin. A few small hunting and fishing communities have developed near the mouth of the rivers.

Anthropogenic Impacts

The Fenholloway River is the only waterbody in the state with a Class V water quality classification (Navigation, Utility and Industrial use). It has been severely affected by the discharge from a paper mill which makes up the entirety of the river's flow in drier times. The large quantities of water withdrawn by the paper mill act to lower the ground water table thus decreasing the amount of base flow that the river would normally receive. Water quality is poor with low DO, high BOD, high conductivity, and other symptoms of high organic loading. A Use Attainability Analysis is now being conducted to determine if the Class V water quality classification can be upgraded to a Class III.

FDEP's groundwater investigations near the Fenholloway River have found contamination in wells linked to upstream pulp mill discharge. All other rivers in the basin have good water quality although somewhat low in DO and pH due to the swampy drainage. The estuaries at their mouths support a healthy biological community with sport and commercial fisheries. Septic tank pollution is a concern in the area because most of the basin's soils are poorly drained and thus incompatible with proper septic tank functions.

The most recent sampling by FDEP indicates that fecal bacteria counts were elevated at the mouth of Sanders Creek. The City of Cross City municipal WWTP discharges to the swamp that drains to this creek, but no direct relation has been proven. Also nutrient and chlorophyll a levels are somewhat elevated in the upper reaches of Spring Warrior and Weaver Warrior Creeks.

Silviculture is a potential source of pollution and has been blamed by local residents for alterations of river characteristics leading to declining fish populations and excessive sedimentation. Compliance and application of silvicultural Best Management Practices has been good. These practices were shown in other studies to alleviate sedimentation and erosion to surface waters. Also ditching and channeling waters in the forested areas may lead to hydrologic disruptions in the estuary, i.e., increased freshwater runoff during rainy times and decreased fresh water release in drier times. Hydrological models comparing the periods of 1952-53 and 1988 showed a 38.6% increase in peak flows.

The Fenholloway, Econfina, and Steinhatchee Rivers have been monitored since 1989 as part of the SRWMD's SWIM program.

** USGS HYDROLOGIC UNIT: 03110102 ECONFINA-FENHOLOWAY

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED		WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
ID	NAME	MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: ESTUARY																												
10	SPRING WARRIOR @ MOUTH	12	76	88	Historical	3.5	0.4	130	14	9.0	81	3.3	53	8	7.6	127	1.06	0.06	12	220	25	2.9	.	.	26000	.	.	57
* WATER BODY TYPE: STREAM																												
1	SAND HILL CREEK	21	89	89	Current	7.1	0.5	68	3	5.2	58	1.2	.	.	7.3	248	0.72	0.03	1	183	.	.	.	.	429	.	34	.
2	STEINHATCHEE RIVER	138	89	93	Current	1.8	0.9	85	7	5.0	53	1.4	.	25	7.4	193	0.80	0.05	2	205	61	3.2	.	19	389	48	35	.
3	BEVINS (BOGGY) CREEK	13	89	89	Current	5.8	.	75	5	3.0	32	1.5	.	.	7.0	225	0.77	0.11	4	600	.	.	.	.	415	.	54	.
4	STEINHATCHEE RIVER	48	89	93	Current	2.8	0.5	200	3	6.3	68	1.2	.	32	7.2	170	0.95	0.07	0	300	.	.	.	.	270	.	41	.
5	EIGHTMILE CREEK	13	89	89	Current	6.5	0.2	95	8	6.2	67	1.7	.	.	7.2	187	0.85	0.05	1	1010	.	.	.	.	339	.	47	.
6	CALIFORINA (ROCKY) CR	7	89	89	Current	7.0	.	65	5	4.2	46	1.3	.	.	7.4	219	0.54	0.03	3	210	.	.	.	.	391	.	40	.
7	STEINHATCHEE RIVER	47	89	92	Current	2.4	0.6	189	5	4.3	46	1.5	.	25	7.2	169	0.82	0.06	0	370	.	.	.	.	316	.	44	.
9	SPRING WARRIOR CREEK	9	81	88	Historical	2.7	0.5	320	2	4.6	49	1.2	29	.	6.9	77	0.79	0.11	3	1193	330	3.2	.	31	221	.	43	.
11	WEAVER WARRIOR CREEK	8	87	88	Historical	4.4	0.7	238	7	4.8	52	1.6	.	.	7.1	121	0.99	0.24	27	2443	648	.	.	.	217	.	48	.
12	FENHOLLOWAY AT MOUTH	4	93	93	Current	0.7	0.2	800	2	3.8	40	5.4	.	55	7.0	202	2.13	0.79	.	.	.	.	.	.	880	.	66	.
13	FENHOLLOWAY BL PULP	27	89	93	Current	2.9	0.1	1750	14	3.9	46	16.6	.	130	7.1	154	6.03	1.89	1	188	.	.	.	.	2250	.	69	.
14	SPRING CREEK	60	70	88	Historical	3.1	0.7	49	1	5.8	60	1.1	22	27	7.5	153	0.78	0.32	1	2750	428	2.8	.	.	315	.	44	.
16	FENHOLLOWAY AB PULP	27	89	93	Current	2.4	0.4	825	3	4.2	47	1.2	.	50	6.6	46	1.52	0.07	1	140	.	.	.	.	98	.	43	.
17	ROCKY CREEK	12	87	88	Historical	3.5	.	103	33	5.6	61	2.2	.	.	7.3	164	0.69	0.39	4	2200	620	.	.	.	317	.	55	.
18	ECONFINA RIVER	91	89	93	Current	1.9	0.5	200	3	5.6	59	1.3	.	22	7.1	143	0.66	0.08	0	263	93	.	3.8	14	268	.	32	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110102 ECONFINA-FENHOLOWAY

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: ESTUARY																
10	SPRING WARRIOR @ MOUTH	FAIR	Historical	0	.	0	0	0	0	x	0	0	0	0	0	x
* WATER BODY TYPE: STREAM																
1	SAND HILL CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
2	STEINHATCHEE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	0	0	0
3	BEVINS (BOGGY) CREEK	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	.
4	STEINHATCHEE RIVER	GOOD	Current	0	0	.	0	0	0	0	x	0	0	.	0	x
5	EIGHTMILE CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
6	CALIFORINA (ROCKY) CR	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	.
7	STEINHATCHEE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	x
9	SPRING WARRIOR CREEK	GOOD	Historical	0	0	.	0	0	0	.	0	0	0	0	0	x
11	WEAVER WARRIOR CREEK	FAIR	Historical	0	0	.	0	0	0	.	0	0	x	.	0	x
12	FENHOLLOWAY AT MOUTH	GOOD	Current	x	x	.	0	0	0	0	x	x	.	.	.	x
13	FENHOLLOWAY BL PULP	GOOD	Current	x	x	.	0	0	0	x	x	x	0	.	0	x
14	SPRING CREEK	GOOD	Historical	0	0	.	0	0	0	.	0	0	0	0	0	x
16	FENHOLLOWAY AB PULP	GOOD	Current	0	0	.	0	0	0	0	x	0	0	.	0	x
17	ROCKY CREEK	FAIR	Historical	0	0	.	0	0	x	.	0	0	x	.	0	.
18	ECONFINA RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	0	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03110102 ECONFINA-FENHOLOWAY

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
10	SPRING WARRIOR @ MOUTH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
1	SAND HILL CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
2	STEINHATCHEE RIVER	YES	GOOD	+	0	0	+	0	0	0	0	+	0	0	.	0	0	+	0	0	0	
3	BEVINS (BOGGY) CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4	STEINHATCHEE RIVER	YES	GOOD	+	0	0	+	0	0	0	0	+	+	0	.	0	0	0	.	0	.	
5	EIGHTMILE CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	CALIFORINA (ROCKY) CR	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	STEINHATCHEE RIVER	YES	GOOD	0	0	0	+	0	0	0	0	0	0	0	.	0	0	0	.	x	.	
9	SPRING WARRIOR CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
11	WEAVER WARRIOR CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
12	FENHOLLOWAY AT MOUTH	NO	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
13	FENHOLLOWAY BL PULP	NO	GOOD	0	0	0	0	0	0	0	0	0	0	0	0	+	+	.	.	0	.	
14	SPRING CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	FENHOLLOWAY AB PULP	YES	GOOD	0	0	0	0	.	0	0	0	+	0	0	0	0	0	.	.	+	.	
17	ROCKY CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
18	ECONFINA RIVER	YES	GOOD	+	+	0	+	0	x	0	0	+	0	0	.	0	0	+	.	+	.	

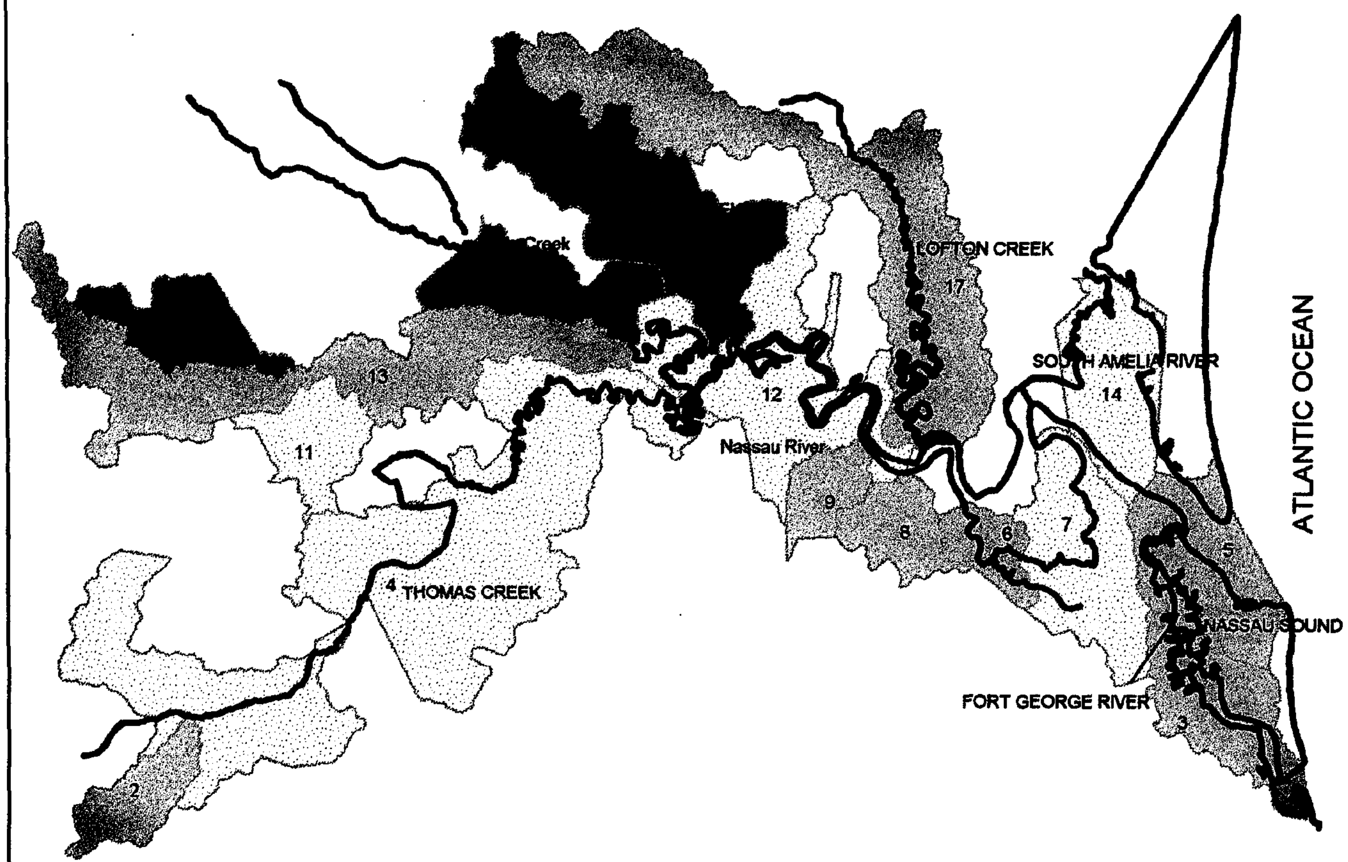
LEGEND:

ALK-ALKALINITY	DOSAT-DO SATURATION	TCOLI-TOTAL COLIFORM	TURB-TURBIDITY
BOD-BIOCHEM. OXYGEN DEMAND	FCOLI-FECAL COLIFORM	TEMP-TEMPERATURE	TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
CHLA-CHLOROPHYLL	FLOW-FLOW	TN-NITROGEN	WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS
DO-DISSOLVED OXYGEN	MEETS USE-MEETS DESIGNATED USE	TOC-T.ORGANIC CARBON	
	PH-PH	TP-PHOSPHORUS	
	SD-SECCHI DISC METERS	TSS-TOTAL SUSPENDED SOLIDS	

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=ECONFINA-FENHOLOWAY HUC=03110102

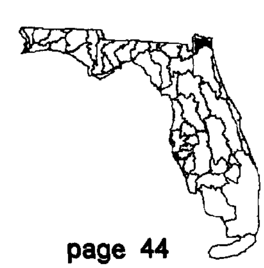
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHBRCHB	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDBCL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
2	3573	STEINHATCHEE RIVER	GOOD	THREAT							X					X	X							X							X						X	
4	3573A	STEINHATCHEE RIVER	GOOD	THREAT							X					X	X							X							X						X	
5	3607	EIGHTMILE CREEK	FAIR	THREAT	X		X																X										X					X
7	3573B	STEINHATCHEE RIVER	GOOD	THREAT							X					X	X							X							X						X	
8*	3588	MUD CREEK		THREAT	X		X																X										X					X
12	3473A	FENHOLLOWAY AT MOUTH	POOR	THREAT			X				X					X								X									X					
13	3473B	FENHOLLOWAY BL PULP	POOR	THREAT			X				X					X								X									X					
14	3518	SPRING CREEK	GOOD	THREAT			X				X					X								X					X	X			X					
15*	3533	UNNAMED SLOUGH		THREAT			X				X					X								X									X					
16	3473C	FENHOLLOWAY AB PULP	GOOD	THREAT			X				X					X								X									X					



NASSAU RIVER BASIN
03070205

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



NASSAU RIVER BASIN

Basic Facts

Drainage Area: 431 square miles
Major Land Uses: forest, wetlands
Population Density: low, except for coastal development (Callahan)
Major Pollution Sources: WWTP, pulp mill, urban runoff
Best Water Quality Areas: Garden Cr., Edwards Cr., Lofton Cr.
Worst Water Quality Areas: Mills Cr., Little Mill Cr., Plummer Cr.
Water Quality Trends: stable quality at 8 sites, degradation at Nassau Sound
OFW Waterbodies: Nassau River State Aquatic Preserve
SWIM Waterbodies: none
Reference Reports:
Coastal Area BAS, DEP (Jacksonville), 1987
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
Town of Callahan WWTP Biological Assessment, DEP, 1991
Anheuser-Busch, Inc., New Sod Farm Biological Assessment, DEP, 1992
Basin Water Quality Experts:
John Hendrickson, SJRWMD, 904/329-4370
Lee Banks, Jim Wright, DEP (Jacksonville), 904/448-4300

Ecological Characterization

The Nassau River Basin drains 430 square miles of predominantly forest and wetlands. There are 55 stream miles in the basin and approximately 10 square miles of estuary (including South Amelia River, the mouth of Nassau River, Sisters Creek and Ft. George River). The blackwater Nassau River's main tributaries (Mills, Alligator and Thomas Creeks) flow slowly in meanders through coastal lowlands. Land use is mostly silviculture, but there are also dairy operations and increasing urbanization.

Anthropogenic Impacts

Historically, the Nassau River Basin has limited STORET data, but has previously shown mostly good water quality. However, the Nonpoint Source Assessment indicates that the Mills-Alligator Creek drainage is moderately impaired from dairies, septic tanks, and urban activities. The town of Callahan WWTP discharges to Alligator Creek which discharges to Mill Creek. Mills Creek exhibits poor water quality and affects some downstream stations. The Thomas Creek drainage is suspected of having problems from similar sources. The Anheuser Busch 50d Farm discharges to Thomas Creek.

The Amelia Islands reach shows minor problems with elevated BOD, turbidity and phosphorus concentrations which could be attributed to development on the islands and/or the effects of a pulp mill discharge to the Amelia River in St. Marys Basin. Sisters Creek and Ft. George River estuaries exhibit good water quality.

** USGS HYDROLOGIC UNIT: 03070205 NASSAU RIVER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD MAX #OBS	BEG YR	END YR	DATA PERIOD	WATER CLARITY TURB	SD	COLOR	TSS	DISSOLVED OXYGEN DO	DOSAT	OXYGEN DEMAND BOD	COD	TOC	PH ALKALINITY PH	ALK	TROPHIC STATUS NITRO	PHOS	CHLA	COLIFORM TOTAL	FECL	BIOLOGICAL SPECIES DIVERSITY NAT	ART	BECK	COND	FLOW	WATER QUALITY INDICES WQI	TSI
* WATER BODY TYPE: ESTUARY																												
1	GARDEN CREEK	24	89	90	Current	6.2	.	.	61	.	.	.	.	.	.	.	0.33	0.11	.	530	353	.	.	.	.	.	.	34
3	FORT GEORGE RIVER	55	89	93	Current	5.8	1.1	23	32	7.5	75	1.1	.	.	7.8	108	0.50	0.08	5	18	7	.	.	.	43550	.	.	47
5	NASSAU SOUND	91	89	93	Current	5.5	0.9	25	42	7.3	81	1.4	.	.	7.7	110	0.44	0.10	.	49	12	2.7	.	.	39450	.	.	44
6	EDWARDS CREEK	14	89	90	Current	7.2	.	.	67	.	.	.	.	.	.	.	0.42	0.10	.	19	12	.	.	.	.	.	.	38
7	PUMPKIN HILL CREEK	7	89	90	Current	4.9	.	.	60	.	.	.	.	.	.	.	0.99	0.08	.	43	19	.	.	.	.	.	.	59
8	MILL BRANCH CREEK	7	89	90	Current	4.5	.	.	47	.	.	.	.	.	.	.	0.46	0.14	.	60	50	.	.	.	.	.	.	41
9	DEESE CREEK	7	89	90	Current	6.2	.	.	61	.	.	.	.	.	.	.	0.59	0.15	.	46	25	.	.	.	.	.	.	45
10	Nassau River	4	79	79	Historical	26.0	0.5	180	106	5.0	57	1.6	.	.	7.7	.	1.74	0.11	.	790	27	2.0	.	.	27100	.	.	76
14	SOUTH AMELIA RIVER	108	89	93	Current	6.2	0.8	39	41	6.4	70	1.4	.	8	7.6	107	0.72	0.10	10	42	10	2.3	.	.	38938	.	.	57
* WATER BODY TYPE: SPRING																												
2	SU-NO-WA SPRINGS	2	72	72	Historical	4.0	.	.	.	0.3	3	0.3	.	3	.	.	0.33	0.01	.	.	.	.	.	.	107	.	35	.
* WATER BODY TYPE: STREAM																												
4	MILLS CREEK REACH	15	89	92	Current	7.2	0.4	400	23	5.5	68	.	.	26	6.4	31	1.26	0.13	3	298	86	.	.	.	3140	.	59	.
11	CUSHING CREEK	6	93	93	Current	3.6	0.5	50	9	5.3	60	.	.	9	7.0	103	0.50	.	3	.	650	.	.	.	381	.	45	.
12	Nassau River	27	89	92	Current	8.1	1.3	375	18	5.5	65	1.1	.	25	6.5	31	1.32	0.24	5	117	48	.	.	.	8145	.	58	.
13	ALLIGATOR CREEK	2	90	90	Current	11.0	.	150	6	6.5	67	0.9	.	.	6.5	.	1.14	0.87	1	520	.	.	.	.	100	.	44	.
15	LITTLE MILL CREEK	4	93	93	Current	18.3	0.1	45	90	5.0	55	.	.	9	6.6	211	1.64	.	59	.	1615	.	.	.	528	.	69	.
16	Mills Creek	9	90	92	Current	5.5	0.5	250	10	4.2	47	6.0	.	30	6.8	63	4.50	1.80	4	.	410	.	.	.	290	.	73	.
17	LOFTON CREEK	14	89	90	Current	6.7	.	.	50	.	.	.	.	.	.	.	0.89	0.15	.	54	35	.	.	.	.	.	44	.
18	PLUMMER CREEK	3	92	92	Current	6.5	0.5	500	6	4.7	55	.	.	28	6.4	28	1.32	0.20	7	.	190	.	.	.	780	.	66	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03070205 NASSAU RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: ESTUARY																
1	GARDEN CREEK	GOOD	Current	0	.	0	.	.	x	.	.	.	0	.	.	.
3	FORT GEORGE RIVER	GOOD	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
5	NASSAU SOUND	GOOD	Current	0	.	0	0	0	x	x	0	0	0	0	.	0
6	EDWARDS CREEK	GOOD	Current	0	.	0	.	.	x	.	.	.	0	.	.	.
7	PUMPKIN HILL CREEK	FAIR	Current	0	.	0	.	.	x	.	.	.	0	.	.	.
8	MILL BRANCH CREEK	GOOD	Current	0	.	x	.	.	x	.	.	.	0	.	.	.
9	DEESE CREEK	GOOD	Current	0	.	x	.	.	x	.	.	.	0	.	.	.
10	Nassau River	UNKN	Historical	0	.	0	0	.	x	x	0	0	0	0	.	x
14	SOUTH AMELIA RIVER	FAIR	Current	0	.	0	0	0	x	x	0	0	0	0	0	0
* WATER BODY TYPE: SPRING																
2	SU-NO-WA SPRINGS	GOOD	Historical	0	0	.	.	.	0	.	0	x	.	.	.	.
* WATER BODY TYPE: STREAM																
4	MILLS CREEK REACH	FAIR	Current	0	0	.	0	0	x	x	0	0	0	.	0	x
11	CUSHING CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	x	.	0	x
12	Nassau River	FAIR	Current	0	0	.	0	0	0	x	0	0	0	.	0	0
13	ALLIGATOR CREEK	GOOD	Current	0	x	.	0	.	0	.	0	0	0	.	0	.
15	LITTLE MILL CREEK	POOR	Current	0	0	.	0	0	x	.	0	0	x	.	x	x
16	Mills Creek	POOR	Current	x	x	.	0	0	0	.	x	0	0	.	0	x
17	LOFTON CREEK	GOOD	Current	0	0	.	.	.	x	.	.	.	0	.	.	.
18	PLUMMER CREEK	POOR	Current	0	0	.	0	0	0	.	x	0	0	.	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03070205 NASSAU RIVER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
1	GARDEN CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	FORT GEORGE RIVER	YES	GOOD	0	0	0	0	0	0	0	.	+	0	0	.	0	0	+	+	0	.	
5	NASSAU SOUND	YES	GOOD	x	x	x	0	.	.	.	.	0	+	.	.	.	.	0	0	.	.	
6	EDWARDS CREEK	YES	GOOD	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	PUMPKIN HILL CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
8	MILL BRANCH CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
9	DEESE CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
10	Nassau River	NO	UNKN																			
14	SOUTH AMELIA RIVER	PARTIAL	FAIR	0	0	+	0	.	0	0	.	+	+	0	.	0	+	0	0	0	.	
* WATER BODY TYPE: SPRING																						
2	SU-NO-WA SPRINGS	YES	GOOD																			
* WATER BODY TYPE: STREAM																						
4	MILLS CREEK REACH	PARTIAL	FAIR	0	0	0	0	.	.	.	.	x	.	.	.	.	.	+	0	.	.	
11	CUSHING CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
12	Nassau River	PARTIAL	FAIR	0	x	x	0	0	.	x	x	0	0	0	0	0	0	0	+	x	.	
13	ALLIGATOR CREEK	YES	GOOD	0	+	0	0	.	.	0	.	.	.	.	.	0	.	.	.	.	.	
15	LITTLE MILL CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	Mills Creek	NO	POOR	0	0	0	0	.	.	0	.	.	.	.	.	0	.	.	.	.	.	
17	LOFTON CREEK	YES	GOOD	0	0	0	0	.	.	.	.	0	.	.	.	.	.	0	0	.	.	
18	PLUMMER CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

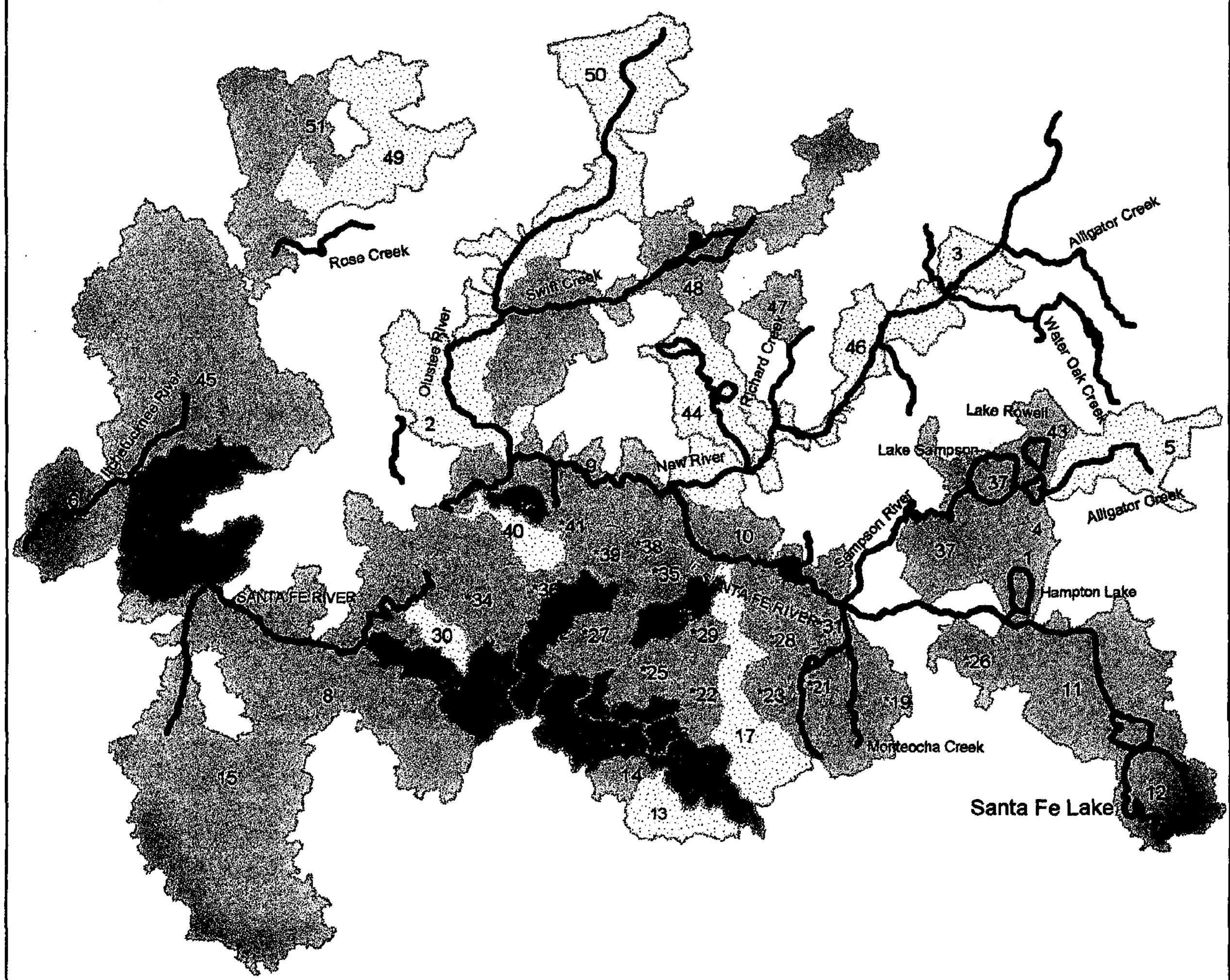
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=NASSAU RIVER HUC=03070205

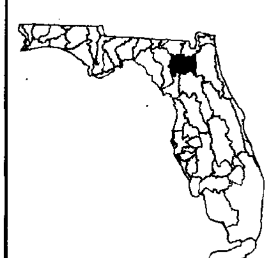
MAP ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
6	2179	EDWARDS CREEK	GOOD	THREAT	X																										X		X					X
10	2148A	Nassau River	POOR	THREAT	X																										X		X					
11	2162	CUSHING CREEK	FAIR	THREAT																																X		X
12	2148B	Nassau River	FAIR	THREAT	X																										X		X					
13	2153	ALLIGATOR CREEK	GOOD	THREAT	X																												X			X		X
14	2149	SOUTH AMELIA RIVER	FAIR	THREAT																													X		X	X		X
17	2129	LOFTON CREEK	GOOD	THREAT																													X					X
18	2130	PLUMMER CREEK	POOR	THREAT																											X		X				X	X



SANTA FE RIVER BASIN
03110206

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES NPS ASSESSMENT

WATER QUALITY
GOOD
THREATENED
FAIR
POOR
UNKNOWN



SANTA FE RIVER BASIN

Basic Facts

Drainage Area: 1,390 square miles
Major Land Uses: forest, agriculture
Population Density: low (Lake City, Starke, High Springs)

Major Pollution Sources: WWTP, septic tank seepage
Best Water Quality Areas: Ichetucknee, most of Santa Fe River below Ichetucknee
Worst Water Quality Areas: Alligator Lake, Rocky Cr., Lake Rowell
Water Quality Trends: stable quality at 10 sites, improving quality on the middle Santa Fe, Alligator Lake and Olustee Cr.
OFW Waterbodies:
O'Leno State Park
Santa Fe River System
Ichetucknee Springs State Park
SWIM Waterbodies:
Santa Fe River
Alligator Lake
Reference Reports:
Santa Fe River System SWIM Plan, SRWMD, 1988
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
City of Stark WWTP Biological Assessment, DEP, 1991
Ichetucknee Springs Hydrogiology Study, Karst Environmental Services, Inc., High Springs, Florida, December, 1991
SWIM 1990 Priority List, SRWMD, 1990
Basin Water Quality Experts:
Robert Mattson, SRWMD, 904/362-1001
Homer Royals, FGFWFC, 904/357-6631

In the News

* A largemouth bass consumption advisory was issued in May, 1989 in parts of the basis. The advisory remains in effect. Research is being conducted on the problem.
* Flooding occurred on the lower Santa Fe and Ichetucknee Rivers in late winter of 1991.
* DEP denied a permit for a 3,000 and a 10,000 cow dairy operation in January and August, 1992, respectively.
* Navy Plane crashed near Worthington Springs in the Santa Fe/Worthington Creek in May, 1992. The fuel spill was controlled.

Ecological Characterization

The Santa Fe River Basin drains 1,390 square miles of mixed land uses in north central Florida. The Santa Fe River has its source in hardwood swamps surrounding and draining Santa Fe/Little Santa Fe Lake and other lakes and swamps nearby apparent, with sinking streams in the region of the Cody Scarp. In this upper part of the basin, it is a sand bottomed creek with blackwater characteristics. In the middle part of the basin, the Santa Fe is joined by two of its main tributaries, New River and Olustee River, both blackwater rivers draining mostly forest, agricultural, pasture, and swamp lands. Further downstream karst features become more apparent. Downstream of its confluence with Olustee River, the Santa Fe disappears into a sinkhole at O'Leno State Park at the toe of the Cody Scarp. The river rises after traveling about 3 miles underground where it receives an average additional flow of 211 cfs of groundwater. From here to its confluence with the Suwannee River, many springs add to the flow. Notably, the Ichetucknee River contributes about 400 cfs of crystal clear spring water to the Santa Fe, bringing its flow to about 2,000 cfs. Water quality on the lower Santa Fe is characterized by higher pH, higher conductivity and alkalinity, and increased water clarity. The river as a whole supports a diverse biological community.

There are increasing amounts of low density residential land use in the basin. The Santa Fe and Ichetucknee Rivers are both popular for recreation. There are dairy operation in the lower Santa Fe/Ichetucknee River area.

Anthropogenic Impacts

The Santa Fe River has been declared an Outstanding Florida Water. Most of the reaches and lakes in the basin that have been sampled meet their designated uses. Because much of this river is naturally low in pH and/or dissolved oxygen due to swamp land drainage and spring flow, the calculation of the WQI is more complicated. However, it is noted from the basin water quality index table that several reaches have minor problems with nutrients and bacteria. These reaches drain mostly swamp lands so the high values appear to be of natural origin or perhaps some agricultural runoff.

There are a few specific problem areas in the basin due primarily to WWTP effluent. Alligator Lake has been partially diked and drained for farmland. It receives Lake City stormwater and, in the past, discharge from the Lake City WWTP which was diverted in the fall of 1987. It has nutrient, algal bloom, aquatic weed and fish kill problems. During low water conditions, the North Lobe of the lake is drained by a sinkhole. Lake Rowell demonstrates a slight eutrophication problem. Some enrichment of heavy metals is evident in the lake's sediment. The City of Starke WWTP discharges to Alligator Creek which drains into the lake. Alligator Creek is impacted by WWTP discharge and possible titanium mining in the area. Santa Fe Lake exhibits good water quality, but with increasing levels of nitrogen. It is connected by the Waldo Canal to Lake Alto. It is also threatened by the City of Melrose storm drainage and development along the shoreline.

Portions of New River exhibit elevated bacteria, nutrient and turbidity values. It receives discharge from the Raiford WWTP and the PRIDE facility, and indirectly from the Lake Butler WWTP. A waste load allocation has been developed for New River because of these sources. There is also a considerable amount of cattle farming in the headwaters that may account for some of the problem values. Conditions in the Santa Fe below New River reflect the lower water quality of the New River. Local experts also indicate that Olustee Creek has poorer water quality than the Santa Fe. At present, the SRWMD is producing a detailed water quality and aquatic biological assessment of the New River to better define the impacts or WWTPs.

The final area of concern is the lower Santa Fe near its confluence with the Suwannee River. There are many dairy farms in the area, and while there is very little surface water drainage from the farms, there is a high potential for ground water contamination. Initial data from the Suwannee River dairy study indicate existing waste management practices at the dairies have the potential to contaminate ground water with elevated nitrates. Based on this data, DEP is requiring all new dairies in the Suwannee River Basin to apply for industrial wastewater permits and provide reasonable assurances that surface water and ground water will be protected. In 1991, data indicate elevated nitrates in ground water near Ft. White and the Ichetucknee River. The Department is currently conducting a sampling investigation to assess the nitrate levels in the area.

Because there are so many springs and underground conduits of water flow, any threat to the ground water is also very important to surface water quality. A pilot study was performed in 1991 to determine the sources of water to springs feeding the Ichetucknee River. Additional studies are proposed to better define the sources in an effort to ensure protection of the spring water quality.

The Santa Fe Basin has been designated a SWIM priority water by the SRWMD. Under the SWIM program a water quality and biological monitoring program of the basin was begun in 1989.

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
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TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD MAX #OBS	BEG YR	END YR	DATA PERIOD	WATER CLARITY TURB	SD	COLOR	TSS	DISSOLVED OXYGEN DO	DOSAT	OXYGEN DEMAND BOD	COD	TOC	PH ALKALINITY PH	ALK	TROPHIC STATUS NITRO	PHOS	CHLA	COLIFORM TOTAL	FECL	BIOLOGICAL SPECIES DIVERSITY NAT	ART	BECK	COND	FLOW	WATER QUALITY INDICES WQI	TSI
* WATER BODY TYPE: LAKE																												
1	HAMPTON LAKE	74	89	92	Current	2.8	1.8	23	3	7.5	83	1.0	.	8	5.6	2	0.53	0.04	3	5	.	.	.	.	67	.	.	43
4	LAKE ROWELL	94	89	92	Current	5.8	1.0	38	5	7.6	83	2.1	.	10	7.0	21	0.66	0.08	12	27	.	.	.	.	278	.	.	53
11	ALTHO DRAINAGE	79	89	93	Current	2.0	1.2	70	3	6.9	84	0.8	.	12	5.9	4	0.74	0.03	7	62	.	.	.	.	68	.	.	46
12	SANTA FE LAKE	186	89	92	Current	1.9	1.6	45	3	7.5	86	1.0	.	11	5.7	3	0.53	0.04	4	9	.	.	.	.	71	.	.	44
43	LAKE CROSBY	74	89	92	Current	3.7	1.1	39	4	7.5	84	1.1	.	13	5.8	3	0.66	0.04	6	20	.	.	.	.	75	.	.	49
47	LAKE BUTLER	25	80	80	Historical	4.0	1.1	80	.	8.1	86	.	.	.	6.0	2	0.53	0.03	16	.	.	.	.	.	51	.	.	52
49	ALLIGATOR LAKE	171	89	93	Current	3.5	0.7	50	3	8.2	94	3.9	.	16	8.5	44	1.51	0.22	40	5	1	.	.	.	148	.	.	67
* WATER BODY TYPE: SPRING																												
30	HORNSBY SPRING RUN	4	92	92	Current	0.2	.	25	2	0.6	6	.	.	.	7.4	144	0.77	0.14	.	.	.	.	.	.	363	.	48	.
* WATER BODY TYPE: STREAM																												
2	OLUSTEE CREEK	46	89	93	Current	2.5	0.4	250	3	5.0	58	1.9	.	34	5.8	10	0.94	0.29	7	150	.	.	.	.	59	.	50	.
3	NEW RIVER	36	90	93	Current	3.0	0.5	375	4	5.2	55	1.9	.	43	4.6	5	1.29	0.05	5	500	.	.	.	.	63	.	51	.
5	ALLIGATOR CREEK	40	89	92	Current	2.9	0.8	39	3	5.7	64	1.7	.	7	6.8	31	1.21	0.26	1	185	.	.	.	.	353	.	46	.
6	SANTA FE RIVER	62	89	93	Current	0.6	2.3	54	2	5.7	60	0.8	.	8	7.4	134	0.81	0.11	0	220	.	.	.	.	312	.	29	.
8	SANTA FE RIVER	138	89	93	Current	1.1	1.0	150	3	5.1	56	0.5	.	13	7.2	81	0.82	0.17	0	110	.	.	.	.	290	.	38	.
9	SANTA FE RIVER	68	89	93	Current	2.0	0.9	220	3	6.9	72	1.0	.	27	6.8	25	1.00	0.27	1	170	65	.	.	.	124	111	39	.
10	SANTA FE RIVER	47	89	93	Current	1.6	0.9	200	3	6.3	66	1.0	.	28	6.3	18	0.89	0.10	0	238	.	.	.	.	135	.	43	.
13	BLUE CREEK	50	79	81	Historical	.	.	.	4	6.4	68	.	107	.	4.8	.	.	0.85	.	.	.	.	.	.	.	.	48	.
14	SANCHEZ PRAIRIE	14	80	81	Historical	.	.	.	4	8.8	93	.	22	.	8.0	.	.	0.12	.	.	.	.	.	.	.	.	26	.
15	COW CREEK	5	92	93	Current	0.7	0.4	320	3	7.7	77	.	.	31	7.2	55	0.69	0.05	.	560	.	.	.	.	116	.	35	.
17	ROCKY CREEK	13	92	93	Current	1.4	0.5	266	3	4.0	40	1.5	.	31	6.0	18	1.07	0.27	.	580	207	.	2.1	3	85	.	55	.
37	SAMPSON RIVER	47	89	93	Current	0.9	0.7	100	3	7.7	82	1.0	.	21	6.8	23	0.77	0.05	1	430	.	.	.	.	189	.	29	.
40	PARENERS BRANCH	5	92	93	Current	5.6	0.7	65	14	8.0	86	.	.	11	6.7	31	1.60	0.79	.	920	.	.	.	.	99	.	47	.
44	FIVEMILE CREEK	8	92	93	Current	3.5	0.4	350	4	4.7	49	1.1	.	.	4.7	6	1.07	0.35	.	911	379	.	3.7	13	73	.	45	.
45	ICHETUCKNEE RIVER	108	89	93	Current	0.2	1.0	3	2	4.7	51	0.5	.	2	7.5	140	0.54	0.06	0	75	.	.	.	.	295	.	26	.
46	NEW RIVER	113	89	93	Current	2.4	0.5	240	3	6.6	69	1.2	.	28	6.5	25	1.18	0.36	1	423	.	.	.	.	86	.	47	.
48	SWIFT CREEK	20	71	71	Historical	4.0	.	.	.	9.2	88	.	.	.	.	.	0.63	1.22	.	.	.	.	.	.	52	12	31	.
50	OLUSTEE CREEK	21	84	84	Historical	2.0	0.5	320	0	3.5	41	1.4	92	.	5.4	0	0.82	0.17	.	3100	285	.	.	.	55	.	52	.
51	CANNON CREEK	4	92	93	Current	2.2	.	208	5	7.8	77	.	.	23	6.4	45	0.61	0.06	.	330	.	.	.	.	99	.	33	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110206 SANTA FE RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK (WQI OR TSI)	DATA RECORD (CURRENT OR HISTORICAL)	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: LAKE																
1	HAMPTON LAKE	GOOD	Current	0	.	0	0	x	0	0	0	0	0	.	0	0
4	LAKE ROWELL	GOOD	Current	0	.	0	0	0	0	0	0	0	0	.	0	0
11	ALTHO DRAINAGE	GOOD	Current	0	.	0	0	x	0	0	0	0	0	.	0	0
12	SANTA FE LAKE	GOOD	Current	0	.	0	0	x	0	0	0	0	0	.	0	0
43	LAKE CROSBY	GOOD	Current	0	.	0	0	x	0	0	0	0	0	.	0	0
47	LAKE BUTLER	GOOD	Historical	0	.	0	0	x	0	.	.	0	.	.	0	0
49	ALLIGATOR LAKE	FAIR	Current	0	.	x	0	0	0	.	x	0	0	.	x	0
* WATER BODY TYPE: SPRING																
30	HORNSBY SPRING RUN	FAIR	Current	0	0	.	0	0	0	0	.	x	.	.	.	.
* WATER BODY TYPE: STREAM																
2	OLUSTEE CREEK	FAIR	Current	0	0	.	0	x	0	0	x	0	0	.	0	x
3	NEW RIVER	FAIR	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
5	ALLIGATOR CREEK	FAIR	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
6	SANTA FE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
8	SANTA FE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
9	SANTA FE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
10	SANTA FE RIVER	GOOD	Current	0	0	.	0	x	0	0	x	0	0	.	0	0
13	BLUE CREEK	FAIR	Historical	.	x	.	x	.	0	.	x	0	.	.	.	.
14	SANCHEZ PRAIRIE	GOOD	Historical	.	0	.	0	.	0	.	0	0	.	.	.	.
15	COW CREEK	GOOD	Current	0	0	.	0	0	0	0	x	0	0	.	.	x
17	ROCKY CREEK	FAIR	Current	0	0	.	0	x	0	0	x	x	0	x	.	x
37	SAMPSON RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	x
40	PARENERS BRANCH	FAIR	Current	0	x	.	0	0	0	0	0	0	0	.	.	0
44	FIVEMILE CREEK	FAIR	Current	0	0	.	x	x	0	.	0	0	0	0	.	x
45	ICHETUCKNEE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
46	NEW RIVER	FAIR	Current	0	0	.	0	0	0	0	x	0	0	.	0	x
48	SWIFT CREEK	GOOD	Historical	0	x	.	.	.	0	.	.	0	.	.	.	.
50	OLUSTEE CREEK	FAIR	Historical	0	0	.	0	x	0	.	0	x	0	.	.	x
51	CANNON CREEK	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	.	.

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT ** USGS HYDROLOGIC UNIT: 03110206 SANTA FE RIVER

TRENDS-SOURCES-CLEANUP

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DOSAT	DO	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: LAKE																						
1	HAMPTON LAKE	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4	LAKE ROWELL	YES	GOOD	0	0	0	+	0	0	0	.	+	.	.	.	0	0	.	.	0	.	
11	ALTHO DRAINAGE	YES	GOOD	0	0	0	0	0	0	0	+	0	x	0	0	0	0	0	.	0	.	
12	SANTA FE LAKE	YES	GOOD	0	0	0	0	0	0	0	0	0	x	x	.	x	x	0	.	x	.	
43	LAKE CROSBY	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
47	LAKE BUTLER	YES	GOOD																			
49	ALLIGATOR LAKE	PARTIAL	FAIR	+	+	+	+	.	+	+	0	+	+	+	.	0	+	0	.	0	.	
* WATER BODY TYPE: SPRING																						
30	HORNSBY SPRING RUN	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
2	OLUSTEE CREEK	PARTIAL	FAIR	+	+	0	0	.	0	0	0	+	0	.	0	0	0	.	.	+	.	
3	NEW RIVER	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
5	ALLIGATOR CREEK	PARTIAL	FAIR	0	0	0	0	.	0	0	.	0	.	.	.	0	0	.	.	0	.	
6	SANTA FE RIVER	YES	GOOD	0	0	0	+	0	0	0	0	+	x	0	0	x	0	+	0	0	.	
8	SANTA FE RIVER	YES	GOOD	+	0	0	+	0	0	0	0	+	x	0	0	0	0	+	.	0	.	
9	SANTA FE RIVER	YES	GOOD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	SANTA FE RIVER	YES	GOOD	0	0	x	0	0	+	0	0	+	0	0	x	0	0	.	.	0	.	
13	BLUE CREEK	PARTIAL	FAIR																			
14	SANCHEZ PRAIRIE	YES	GOOD																			
15	COW CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
17	ROCKY CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
37	SAMPSON RIVER	YES	GOOD	0	0	0	0	.	+	0	0	0	0	.	0	0	0	.	.	0	.	
40	PARENERS BRANCH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
44	FIVEMILE CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
45	ICHETUCKNEE RIVER	YES	GOOD	0	0	0	0	.	.	x	0	0	+	.	+	0	0	.	.	+	.	
46	NEW RIVER	PARTIAL	FAIR	0	x	0	+	.	+	x	x	0	0	.	x	0	0	0	.	+	.	
48	SWIFT CREEK	YES	GOOD																			
50	OLUSTEE CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
51	CANNON CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

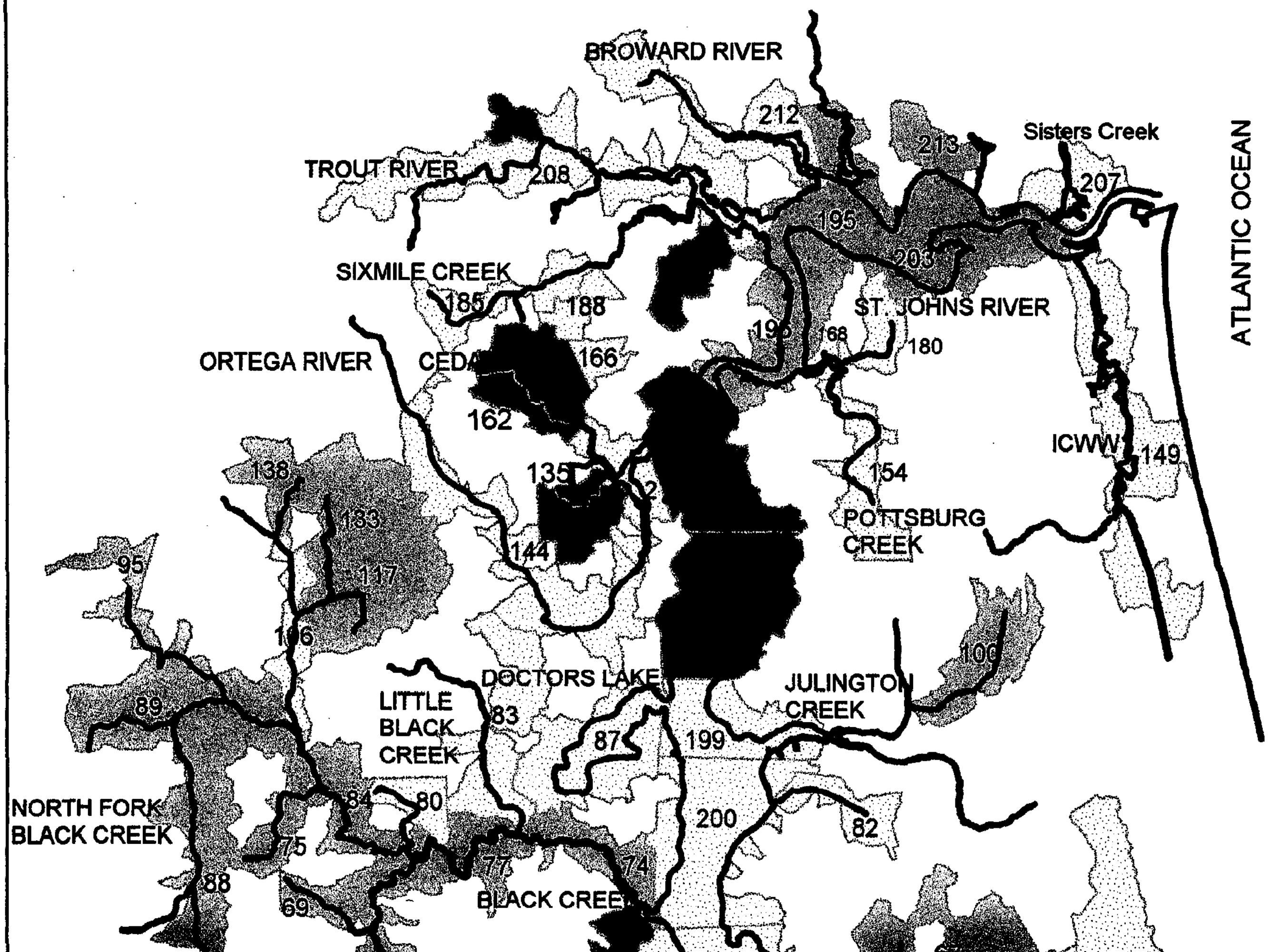
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=SANTA FE RIVER HUC=03110206

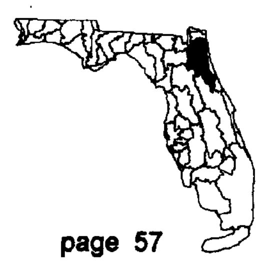
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
2	3504a	OLUSTEE CREEK	FAIR	THREAT						X																								X				
6	3605a	SANTA FE RIVER	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
7*	3605b	SANTA FE RIVER		THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
8	3605c	SANTA FE RIVER	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
9	3605d	SANTA FE RIVER	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
10	3605e	SANTA FE RIVER	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
11	3605f	ALTHO DRAINAGE	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
12	3605g	SANTA FE LAKE	GOOD	THREAT	X	X	X		X	X	X				X	X	X					X	X								X			X		X	X	X
13	3682	BLUE CREEK	FAIR	THREAT																														X		X		
14	3681	SANCHEZ PRAIRIE	GOOD	THREAT			X																X												X			
16*	3678	HAGUE BRANCH		THREAT						X					X																				X			
17	3641	ROCKY CREEK	FAIR	GOOD																																		
18*	3671	ALACHUA SLOUGH		THREAT			X																X												X			
19*	3654	MONTEOCHA CREEK		GOOD																																		
20*	3670	BURNETTS LAKE DRAIN		THREAT	X							X	X																		X				X			
21*	3663	LITTLE MONTEOCHA CREEK		GOOD																																		
22*	3666	UNNAMED BRANCH		GOOD																																		
23*	3669	UNNAMED BRANCH		GOOD																																		
24*	3660	UNNAMED SLOUGH		THREAT					X	X																								X				
25*	3664	UNNAMED BRANCH		GOOD																																		
26*	3658	UNNAMED CREEK		GOOD																																		
27*	3651	UNNAMED BRANCH		GOOD																																		
28*	3648	RHUDA BRANCH		GOOD																																		
29*	3657	UNNAMED BRANCH		GOOD																																		
30	3653	HORNSBY SPRING RUN	FAIR	GOOD																																		
31*	3655	TROUT POND OUTLET		GOOD																																		
32*	3644	MILL CREEK SINK		THREAT					X	X																												
33*	3647	UNNAMED BRANCH		THREAT	X																										X							
34*	3638	UNNAMED SLOUGH		GOOD																																		
35*	3637	UNNAMED BRANCH		GOOD																																		
36*	3642	TOWNSEND BRANCH		GOOD																																		
38*	3627	UNNAMED BRANCH		GOOD																																		
39*	3625	UNNAMED CREEK		GOOD																																		
40	3626	PARENERS BRANCH	FAIR	THREAT					X																													
41*	3621	UNNAMED CREEK		GOOD																																		
42*	3623	UNNAMED DRAIN		THREAT					X																													
50	3504	OLUSTEE CREEK	FAIR	THREAT						X																								X				

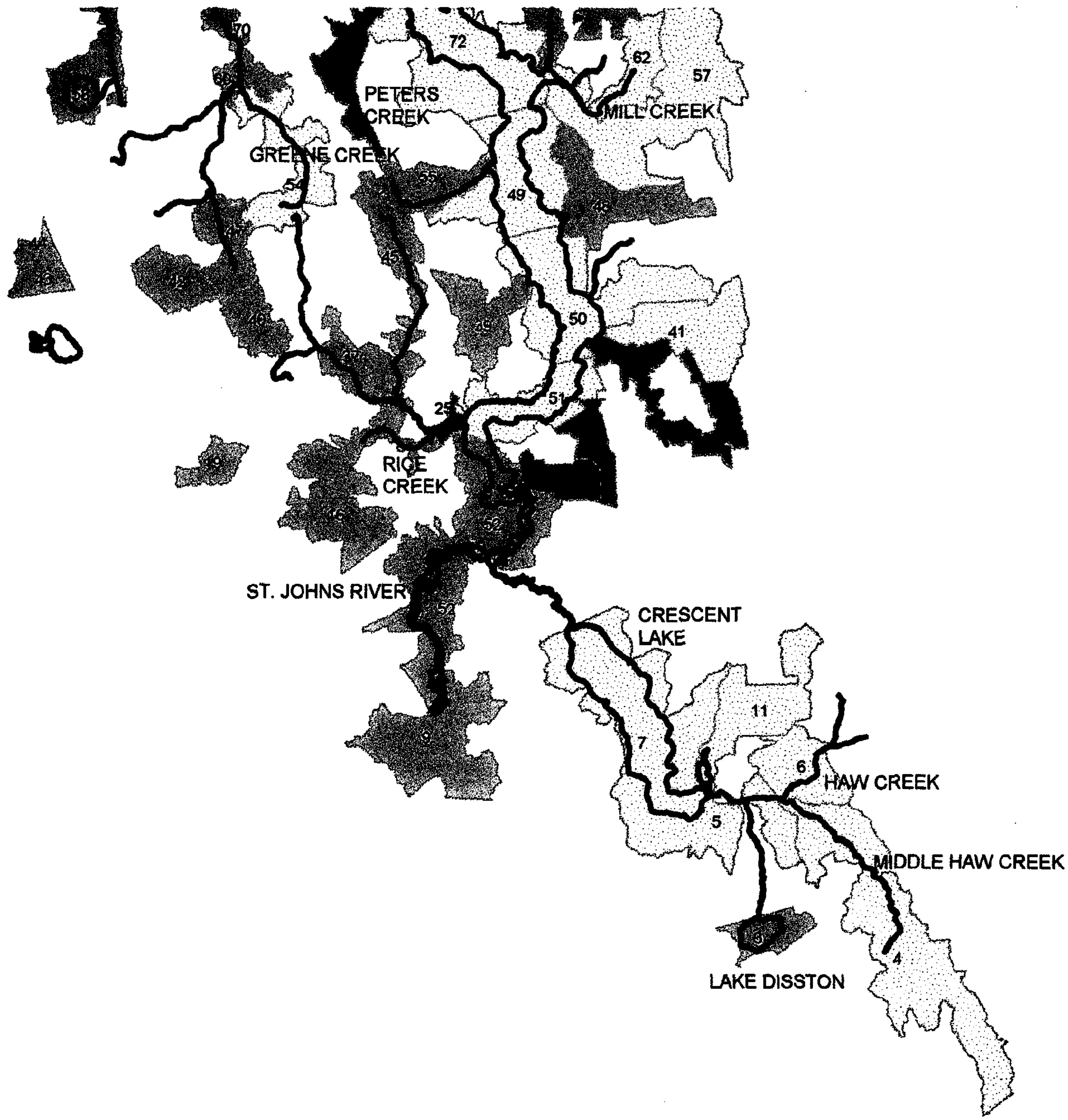


LOWER ST. JOHN'S RIVER BASIN
03080103

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN

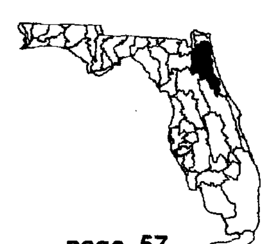




LOWER ST. JOHN'S RIVER BASIN
03080103

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



LOWER ST. JOHNS RIVER BASIN

Basic Facts

Drainage Area: approximately 2,200 square miles; 13 major sub-basins
Major Land Uses: forestry, agriculture, rapid transition to urban, intense urbanization in downstream areas
Population Density: moderate, except in highly urban Jacksonville area (Palatka, Green Cove Springs, Orange Park)
Major Pollution Sources: urban stormwater, WWTP's, industry, agriculture septic tanks
Best Water Quality Areas: Black Creek (North Fork), Simms Cr., Kingsley Lake, Lake Broward
Worst Water Quality Areas: Cedar River, St. Johns River above Buckman Bridge and Warren Bridge, Fishing Creek, Goodbys Cr.
Water Quality Trends: stable quality at 18 sites, degrading trend at St. Johns River above Warren Bridge, and Trout River, improving trend at Ortega River, Etonia Cr., Black Cr., and the St. Johns River above US1
OFW Waterbodies:
Haw Creek State Preserve
Mike Roess Gold Head Branch State Park
Nassau River-St. Johns Marshes Aquatic Preserve
Kingsley Lake and North Fork Black Creek (upper portion)
Ravine Gardens
SWIM Waterbodies:
entire basin, including Crescent Lake
Lake Disston Sub-basin
Reference Reports:
Lower St. Johns River SWIM Plan, revised November 1989
Lower St. Johns River Water Quality Review, 1986
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In the News

* Since 1987 the City of Jacksonville has reduced 43% of the small package wastewater treatment plants with regionalization to larger treatment facilities.
* Since 1988, through the efforts of the SWIM Program of the Duval County Health Unit, 1038 failing septic tank systems were located and repaired by permit. An additional 1435 failing septic systems have been referred to the City of Jacksonville's Public Utilities Department for regional connection through the Superfund Septic Tank Phase Out Program.
* In 1992, Seminole Kraft, a manufacture of unbleached paper, reconfigured the mill to produce linerboard from 100% recycled fiber reducing their wastewater flow to an average of 10 MGD, a reduction of approximately 75%.

Ecological Characterization

The St. Johns River is Florida's longest river (300 miles) and flows northward from its origins west of Ft. Pierce, to its mouth, near Jacksonville. It is extremely slow moving with a drop of less than 30 feet over its entire length. The lower St. Johns River is defined as the section between the Oklawaha River (entering at about 160 cfs) and the Atlantic Ocean. This segment of the river is essentially an elongated lagoon, having a low gradient and narrow floodplain. The river averages more than two miles in width downstream of Palatka (in some places it exceeds three miles) and contains numerous tributary streams and embayments.

The entire lower St. Johns River is subject to tidal influence. The low gradient in the St. Johns River combined with the effects of low flow, tides, and wind direction result in short-term reverse flows. Although these reverse flows may continue for several days, there is a net downstream flow approximately 75% of the time. The total average flow of the river is estimated at 7000 cfs. Development impacts along the river vary by area. The reach between Palatka and Green Cove Springs has experienced only modest development as homesites, but below Doctors Lake to the Trout River, the river is almost entirely lined with homes, buildings, marinas and docks. In contrast, there are few docks and homes from Trout River to Mayport. From downtown Jacksonville to the Atlantic Ocean, the river is dredged and maintained by the Corps of Engineers for deepwater navigation (a 12 foot deep channel is maintained by Corps of Engineers from Jacksonville to Lake George). Also there are several bridge crossings: seven in Duval County; one in Green Cove Springs; and one in Palatka.

The tributary systems entering the St. Johns are generally blackwater in nature and drain mostly low pine lands. Downstream of Doctors Lake, on the west bank and in the Julington Creek area, most of the tributaries have considerable urban development, both residential and, near Jacksonville, industrial.

Anthropogenic Impacts

This assessment of the lower St. Johns River begins in the southern portion of the basin, and then moves northward to the Duval County portion of the basin. Water quality of the southern portion of the lower St. Johns River is judged to be good, especially at its confluence with the Oklawaha, but generally degrades downstream. There is an increase in nonpoint source nutrient discharge resulting from runoff from row-crop agriculture. The Palatka area also provides urban runoff and septic tank leachate.

There are problems in most of the tributary stream systems of the river. The first tributary system in the southern basin is Haw Creek/Crescent Lake/Dunns Creek. It has acidic colored water attributable to its swampy drainage area and DO and nutrient problems attributable to agricultural runoff, septic tanks and WWTP effluents. Point sources in this area include the Crescent City WWTP discharging to Crescent Lake and the City of Bunnell WWTP discharging to Haw Creek. Crescent Lake is eutrophic and a 1975 EPA study estimated that about half the nutrient load to the lake came from Haw Creek. Recent estimates of nutrient loading identified agricultural runoff as the main source of nutrient loads. A second study of the lake by DEP's Biology Section was performed in June, 1990. That study found depressed macroinvertebrate diversities, significant blue-green algal blooms, and high algal growth potential and chlorophyll a concentrations in Crescent Lake, Bull Creek Canal, and Dead Lake. Depressed oxygen levels, below State water quality standards, were encountered in Dead and Crescent Lakes. In addition, elevated levels of zinc, copper, and cadmium were found in sediments from the vicinity of potato and cabbage farming operations. The lake is used for fishing and blue crab trapping, though few people use the lake for swimming. Lake Disston is threatened by land clearing operations close to the shoreline and row-crop farming, but is still enjoyed for both fishing and swimming.

The Rice Creek tributary system, located just north of Palatka, arises from a pine flatwood/mesic hammock system. The creek's discharge has low DO and pH. Elevated bacteria counts in the vicinity of the Etonia Creek watershed may be accounted for by dairy farms. The lower portion of Rice Creek receives a large volume of effluent from a paper mill (Georgia-Pacific) which has very low DO values and high nutrient, BOD and color values. The macroinvertebrate communities in the creek exhibit a low diversity with only a few highly tolerant species. Georgia-Pacific uses a process of supersaturating their effluent with oxygen before discharging to Rice Creek and in the vicinity of the discharge high values of DO are encountered. In the past, a short distance downstream the low DO problem reoccurred. More recent data indicate that the problem has abated. Rice Creek degrades the St. Johns River both upstream and downstream of its confluence. Simms Creek, Boggy Branch, Greens Creek, and Clarkes Creek have sporadic turbidity problems due to spills from upstream titanium mining operations.

The next problem area in the lower St. Johns River basin is Trout Creek. For a few years in the mid-1980s, it received very poorly treated effluent from the Homer Smith scallop processing plant. The plant has ceased operation in 1986, which has improved water quality. St. Johns County acquired the site and turned it into a park in 1992 with a boat ramp and picnic area. There is a nonpoint source threat from development in the upper Trout Creek drainage.

The Black Creek/Peters Creek tributary system has fairly good water quality but is threatened by urban and agricultural runoff. Nutrient and BOD problems occur, probably caused by agricultural and dairy runoff. These problems are more evident in Peters Creek, labeled as seriously impaired by the Nonpoint Source Assessment. The area is undergoing rapid development which is affecting the stream system with increased domestic wastewater discharge, septic tank and stormwater runoff.

Julington and Durbin Creeks are undergoing some of the most rapid development in the basin. Increased siltation and an associated decrease in fish breeding ground and fish populations have been documented in these sub-basins. Wasteload allocations are proposed for the numerous small WWTPs in the Julington Creek and Durbin Creek area. Both of these tributary systems drain low-gradient swampy lands into a large floodplain. Poorly drained upland areas are scattered throughout the drainage. Thus, continued development frequently involves wetland disruption. It is estimated that about one-half of the wetlands in the Julington Creek drainage have been lost in the last 20 years. The eastern riverbank downstream of this drainage (area of Mandarin and Goodbys) is severely altered and degraded by marinas and near-shore development.

Doctors Lake is highly eutrophic as a result of excessive nutrient loading from historic WWTP discharge, septic tank leachate and urban runoff. New golf courses, residential developments and shopping centers are being built in the Doctor's Lake watershed. The lake's poor circulation and limited hydraulic flushing further compound water quality problems. The effluents from the Orange Park plant and several other WWTPs were diverted from the lake in the late seventies and routed to the St. Johns River. The lake still exhibits eutrophication problems (algal blooms, fish kills, turbidity) attributed to urban runoff, and has been closed to swimming.

The most concentrated area of water quality problems in the lower St. Johns River is found in the Duval County portion of the basin. This section of the basin is one of several large industrialized regions in the State and one of the largest residential centers as well. Duval County has approximately 300 permitted point source dischargers. A wide range of water quality problems are found including dissolved oxygen, nutrient, bacteria and toxics. Also an outbreak of Ulcerative Disease Syndrome (UDS) in a variety of fish species has persisted in the Lower St. Johns River for the past decade. Studies were unable to determine whether the outbreaks of disease were related to pollution levels. A Lower St. Johns River Water Quality Review prepared by DEP in 1986 presented a overview of the river's status and made recommendations for controlling domestic and industrial effluents and stormwater runoff. That report, as well as the findings of other studies and experts on the basin, indicated that the tributaries were more heavily polluted than the river itself, particularly in sediment quality. A brief review of the problem areas is presented below. Starting in the southern portion of Duval County, one of the notable problem areas is the Cedar River/Wills Branch/Ortega River system. Cedar River has the worst water quality in the area with frequent fish kills. The area receives discharges from wire and chemical industries as well as numerous wastewater treatment package plants. This tributary system appears to have a negative impact on the quality of the St. Johns River itself. However, just north of this segment (at the horizontal "bend" in the river), the St. Johns also receives drainage from two severely polluted urban creeks (not shown on map) and the Jacksonville shipyards. Adjacent to this reach are Strawberry and Pottsburg Creeks which also exhibit poor water quality caused by pollution loads from WWTPs and stormwater runoff.

The "bend" area is probably the most polluted and developed portion of the river. Both banks are almost completely sea-walled and lined with industries or downtown development. It appears that the shipyard, which previously conducted sandblasting and painting directly adjacent to the river, is closing down. While the shipyard is being closed down there still is much sandblasting and painting at the docks. Two other major sources are Jacksonville's regional WWTP (Buckman Street WWTP) discharging 52 MGD, and Jefferson Smurfit (formerly Alton Box and Packaging Corporation) with a total discharge of 14 MGD. The Buckman plant, which generally provides good treatment, also accepts some industrial wastes which cause occasional upsets in the treatment process.

The Ribault River, lower Trout River and Moncrief Creek, probably the second worst tributary system after Cedar River, also empty into the St. Johns River a few miles north of this area. Downstream from the confluence of Trout River, the St. Johns River receives treated paper mill wastewater effluent (Kraft Paper Company at 20 MGD). Discharges from Broward River and Dunn Creek further affect the river. These tributaries, although not as severely degraded as the previously mentioned systems, exhibit low DO values and high concentrations of nutrients and BOD from domestic and industrial point sources and some dairy operations. From Dunn Creek to the mouth there is more flushing and dilution from the tides and more vegetated banks and marshes. Commercial shrimpers work the St. Johns between May Port and the Matthews Bridge, seaward of downtown Jacksonville. Only recreational shrimping occurs between Jacksonville and Lake George.

In summary, the southern portion of the Lower St. Johns Basin generally exhibits good to fair water quality. With the exception of one tributary system with poor water quality due to a point source, the major sources of pollution are runoff from rangelands and construction sites. On the contrary, the Duval County portion of the basin generally has poor water quality. Both domestic and industrial point sources are major contributors to the problem as well as urban stormwater and septic tanks. For several years it has been recognized that the tributary systems in this area are seriously degraded. However, more recently there has been growing concern over the river itself. Benthic biological data indicate poor diversities and low density. Water quality trends for most of the river reaches indicate degradation problems. However, there is improvement of the river's water quality near its mouth due to the flushing effects of the tides.

Duval County continues to grow and several of the WWTPs discharging to the St. Johns are considering expansion. However, there are active efforts to regionalize the county, and centralize wastewater treatment into larger facilities in order to decrease or remove small facilities and septic tank drainage from the tributaries. Duval County has a $4,000,000 revolving trust fund which is used to purchase private package plants and connect them to the county's regional WWTP.

The 1987 Florida Legislature passed the Surface Water Improvement and Management (SWIM) Act which will provide funds to the State's Water Management Districts to restore or preserve some of the critically threatened water bodies. Key aspects of the SWIM Plan submitted by the St. Johns River Water Management District area:

1. a Master Stormwater Plan being developed by the City of Jacksonville and the water management district;
2. increased enforcement of regulations regarding septic tanks, package plants, etc. (through SWIM funded contracts with Duval, St. Johns, Clay and Putnam Counties);
3. studies and programs designed to reduce nutrient input from agricultural activities in St. Johns, Flagler and Putnam Counties;
4. more comprehensive monitoring of the river and tributaries (as a system); and
5. technical assistance to local governments.
6. monitoring to determine phytoplankton species and productivity, benthic fauna and toxic substance contamination, and demersal fish assemblages to determine assimilative capacity and food chain dynamics.

There was a 305b meeting held in the Northeast District DEP office on July 18, 1994. Part of the objective of this meeting was to designate reaches on the lower St. Johns River and to determine what indices should be used for each reach. Attached is the location and the justification for the indices used for each reach. The following indices are used in the attachment.

Index	Description	Application
WQI	Water Quality Index	River systems with high flow
TSI-L	Trophic State Index-Lake	Freshwater bodies with little or no flow.
TSI-E	Trophic State Index-Estuary	Large water bodies such as bays or lagoons with low flow used to mix freshwater from the rivers with saltwater from the ocean

LOWER ST. JOHNS RIVER REACH DESIGNATIONS

MAPID #	LOCATION	INDEX	JUSTIFICATION
204	From just west of the ICW to the mouth	WQI	River with high flow
203	From Dames Pt. to just west of the ICW	WQI	River with high flow
195	From just south of the Trout River to Dames Point	WQI	River with high flow
196	From just south of the Fuller Warren Bridge to just south of the Trout River	WQI	River with high flow
197	From Piney Pt. to just south of the Fuller Warren Bridge	TSI-E	Fresh and salt water mixing zone with low flow.
198	From just north of Doctors Lake to Piney Point	TSI-E	Fresh and salt water mixing zone with low flow.
199	From just south of Julington Creek to just north of Doctors Lake	TSI-L	Freshwater with low flow
200	From just south of Black Creek to just south of Julington Creek	TSI-L	Freshwater with low flow
72	From just south of Palmo Cove to just south of Black Creek	TSI-L	Freshwater with low flow
49	From just south of Tocoi Creek to just south of Palmo Cove	TSI-L	Freshwater with low flow
50	From Federal Point to just south Tocoi Creek	TSI-L	Freshwater with low flow
51	From just south of Rice Creek to Federal Point	TSI-L	Freshwater with low flow
52	From just west of Dunns Creek to just south of Rice Creek	WQI	River with high flow
52	From just south of the Oklawaha River to just west of Dunns Creek	WQI	River with high flow
9	From Black Point to just south of Oklawaha River	WQI	River with high flow

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: ESTUARY																												
149	ICWW	242	89	93	Current	3.8	0.8	58	40	6.6	71	1.1	.	.	7.5	77	0.75	0.11	.	303	63	.	.	.	15205	.	.	56
197	SJR AB FULLER WARREN B	447	89	93	Current	4.7	0.7	65	17	7.3	83	1.0	.	.	7.7	.	1.08	0.13	7	400	40	.	.	.	9474	.	.	62
198	SJR AB PINEY POINT	333	89	93	Current	3.5	0.6	69	13	7.8	85	1.0	.	.	7.7	.	1.18	0.10	1	98	20	.	.	.	4800	.	.	63
207	SISTERS CREEK	40	92	93	Current	4.2	1.0	35	16	7.4	75	1.1	.	.	7.7	84	0.65	0.07	.	75	13	.	.	.	38275	.	.	55
213	BROWNS CREEK	4	92	92	Current	6.8	0.9	25	19	6.5	73	.	.	6	6.9	135	0.35	0.09	.	.	10	.	.	.	43000	.	.	47
* WATER BODY TYPE: LAKE																												
3	Lake Disston	35	89	89	Current	1.1	0.8	200	1	6.6	80	.	.	.	6.4	6	0.87	0.03	.	10	.	.	.	.	70	.	.	54
7	Crescent Lk	96	89	93	Current	13.7	0.6	188	8	7.7	84	1.7	.	.	7.3	40	1.36	0.08	26	157	24	.	.	.	671	.	.	68
19	GRANDIN LAKE OUTLET	4	90	91	Current	8.1	0.9	29	8	7.2	87	.	.	4	4.9	2	0.56	0.05	18	.	.	.	.	.	57	.	.	55
40	GEORGES LAKE	4	89	89	Current	2.3	2.2	50	1	8.8	95	0.6	.	.	4.4	1	0.21	0.00	2	.	.	.	.	.	50	.	.	20
42	LAKE JOHNSON	5	90	92	Current	5.1	1.0	8	5	7.9	96	.	.	1	4.2	1	0.26	0.02	4	.	1	.	.	.	50	.	.	43
43	BEDFORD LAKE	7	90	91	Current	5.4	1.1	15	7	7.7	94	.	.	2	5.0	3	0.38	0.03	10	.	.	.	.	.	63	.	.	49
44	CRYSTAL LAKE	2	90	90	Current	2.1	1.0	8	.	8.2	98	.	.	6	7.2	10	0.80	0.01	10	.	.	.	.	.	40	.	.	47
49	SJR AB PALMO CR	12	91	91	Current	3.2	0.7	150	19	5.2	58	1.9	.	.	7.3	63	1.22	0.05	.	10	5	.	.	.	995	.	.	64
50	SJR AB TOCIO	64	89	93	Current	5.1	0.7	98	10	7.4	83	2.5	.	15	7.6	80	1.27	0.10	24	20	5	.	.	.	1000	0	.	63
51	SJR AB FEDERAL PT	82	89	92	Current	11.2	0.8	108	8	7.6	87	2.1	.	14	7.5	76	1.14	0.06	23	122	11	.	.	.	960	.	.	62
58	KINGSLEY LAKE OUTLET	68	92	93	Current	0.6	4.9	5	2	8.8	94	0.9	.	.	6.7	9	0.35	0.01	.	8	1	.	.	.	79	.	.	18
72	SJR AB BLACK CR	80	89	93	Current	4.4	0.9	115	9	8.0	87	1.7	.	14	7.7	68	1.20	0.08	13	93	9	.	.	.	1000	0	.	60
87	DOCTORS LAKE	107	89	93	Current	5.6	0.7	100	12	8.4	91	1.0	.	17	7.8	60	1.38	0.08	35	130	10	.	.	.	2102	0	.	66
199	SJR AB DOCTOR LAKE	192	89	93	Current	3.5	0.6	70	10	8.9	89	1.0	.	.	7.7	.	1.12	0.09	.	105	15	.	.	.	2214	.	.	63
200	SJR AB JULINGTON CR	28	90	92	Current	3.4	0.8	105	10	6.5	73	1.2	.	13	6.8	62	1.16	0.11	12	66	11	.	.	.	995	0	.	61
* WATER BODY TYPE: STREAM																												
1	Dunns Creek	32	89	93	Current	4.3	0.8	150	8	7.0	79	2.1	.	17	7.3	68	1.31	0.05	23	2300	40	.	.	6	910	0	42	.
2	ORTEGA RIVER	28	89	90	Current	3.1	.	.	26	8.7	91	.	.	.	7.6	.	1.03	0.44	.	1610	173	.	.	.	531	.	44	.
4	MIDDLE HAW CREEK	30	89	89	Current	1.6	0.7	240	2	3.8	44	.	.	.	5.9	7	1.19	0.03	.	760	.	.	.	.	153	.	45	.
5	HAW CK AB CRESCENT LK	29	93	93	Current	5.9	0.9	175	4	3.2	32	1.0	.	.	7.0	46	1.03	0.11	.	3125	1731	3.0	1.6	5	1130	.	57	.
6	HAW CREEK	30	89	89	Current	4.0	0.9	200	2	3.4	39	.	.	.	7.2	57	1.39	0.05	.	415	.	.	.	15	830	.	48	.
9	SJR ab Oklawaha River	63	91	93	Current	3.1	0.7	95	13	8.6	93	2.2	.	.	8.0	71	1.34	0.05	.	24	5	.	.	.	1229	.	34	.
11	BULL CREEK DITCHES	10	89	89	Current	4.4	.	123	3	3.5	39	1.2	.	.	7.0	147	1.34	0.34	3	.	.	.	.	.	1655	.	54	.
16	RICE CREEK	43	89	92	Current	3.8	0.5	325	3	6.3	72	0.9	.	33	6.4	34	1.09	0.06	0	580	91	.	.	.	205	.	43	.
18	MILL BRANCH	12	89	89	Current	10.8	.	125	6	5.0	56	1.6	.	.	6.7	82	1.47	0.99	2	.	.	.	.	.	1020	.	63	.
20	WEST RUN INTERCEPTER D	17	89	93	Current	9.1	0.2	329	9	4.5	49	1.2	.	.	6.7	125	1.25	0.19	2	.	.	.	.	.	1296	.	62	.
25	RICE CREEK	54	90	93	Current	13.0	0.3	600	8	4.9	55	4.5	.	35	7.1	128	1.73	0.19	10	160	20	.	.	.	995	0	65	.
37	ETONIA CREEK	16	89	92	Current	1.4	0.7	48	2	7.1	81	0.8	.	4	7.2	80	0.44	0.09	1	.	53	.	.	.	210	0	20	.
38	DEEP CREEK	31	89	93	Current	2.5	1.0	100	5	3.5	37	2.1	.	19	6.8	89	1.21	0.37	2	.	.	.	.	.	1530	0	61	.
39	CEDAR CREEK	9	91	91	Current	1.8	0.6	80	8	5.0	63	1.5	.	.	7.0	82	1.32	0.07	.	34	.	.	.	.	1110	.	40	.
41	MOCCASIN BRANCH	17	89	93	Current	2.9	0.6	275	4	4.4	48	0.8	.	.	6.6	97	1.17	0.22	1	.	.	.	.	.	1006	.	49	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
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		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
45	SIMMS CREEK	5	89	89	Current	2.3	.	150	1	6.8	71	0.6	.	.	5.1	4	0.58	0.04	0	.	.	.	.	.	60	.	15	.
47	ATES CREEK	11	91	92	Current	1.3	0.7	225	4	7.3	69	1.2	.	28	4.2	1	0.62	0.13	0	170	50	.	.	.	60	.	32	.
48	TOCOI CREEK	18	89	89	Current	1.5	.	93	1	2.3	26	1.0	.	.	6.5	75	1.09	0.26	1	.	.	.	.	.	1625	.	42	.
52	SJR AB RICE CR	163	89	93	Current	3.7	0.8	75	11	7.6	87	1.7	.	14	7.5	81	1.17	0.05	23	64	22	.	.	.	1085	0	37	.
54	GREENE CREEK	14	91	91	Current	2.0	0.6	140	4	6.3	58	1.9	.	.	5.9	5	1.15	0.05	.	1230	700	.	.	.	55	.	46	.
55	CLARKES CREEK	4	89	89	Current	8.1	.	400	3	6.4	72	0.7	.	14	6.4	36	0.67	0.06	0	.	.	.	.	.	160	.	32	.
57	SIXMILE CREEK	31	89	93	Current	2.0	0.9	225	5	4.7	55	2.1	.	17	6.8	68	1.26	0.10	11	.	.	.	.	.	680	0	52	.
60	Black Creek S.fork	7	92	92	Current	2.0	0.4	75	3	8.9	91	.	.	8	6.0	4	0.42	0.10	0	.	83	.	.	.	55	.	26	.
61	PETERS CREEK	34	89	92	Current	4.3	0.6	150	3	2.5	30	2.0	.	22	6.2	19	1.59	0.36	5	485	92	.	.	.	120	.	66	.
62	MILL CREEK	3	92	92	Current	5.7	0.3	100	3	5.6	60	.	.	14	6.6	113	1.02	0.13	0	.	300	.	.	.	410	.	52	.
67	TROUT CREEK	8	89	92	Current	2.7	0.4	163	4	5.9	68	1.4	.	15	6.8	63	1.24	0.06	24	.	100	.	.	.	695	.	43	.
69	MILL CREEK	3	92	92	Current	6.6	0.5	250	3	8.8	88	.	.	15	5.8	13	0.41	0.02	1	.	227	.	.	.	80	.	36	.
70	Black Creek S.fork	42	90	93	Current	2.7	1.2	169	2	6.1	68	1.2	.	15	6.0	12	0.56	0.10	1	668	205	.	.	.	77	0	36	.
74	BLACK CK AB STJR	51	91	91	Current	2.1	0.6	200	3	3.9	38	0.8	.	.	6.6	21	1.29	0.11	.	190	20	.	.	.	198	.	35	.
75	BIG BRANCH	3	92	92	Current	2.8	0.3	250	1	7.9	81	.	.	17	6.2	31	0.40	0.06	0	.	186	.	.	.	100	.	34	.
77	BLACK CREEK	50	89	93	Current	2.7	1.1	175	1	5.5	60	0.7	.	18	6.2	13	0.66	0.08	0	150	50	.	.	.	93	.	33	.
80	GROG BRANCH	4	92	92	Current	10.7	0.7	325	8	7.5	76	.	.	22	6.2	24	0.66	0.02	2	.	147	.	.	.	110	.	45	.
82	CUNNINGHAM CREEK	3	92	92	Current	3.1	1.0	100	1	2.2	27	.	.	13	6.2	25	0.74	0.05	2	.	92	.	.	.	130	.	46	.
83	LITTLE BLACK CREEK	3	92	92	Current	2.3	0.5	400	1	3.3	34	.	.	30	5.5	11	0.78	0.02	0	.	106	.	.	.	90	.	50	.
84	NORTH FORK BLACK CREEK	13	91	91	Current	2.0	1.2	150	2	7.7	71	0.7	.	.	6.8	10	0.98	0.05	.	280	120	.	.	.	95	.	23	.
88	NORTH FORK BLACK CREEK	28	91	91	Current	1.1	1.1	55	1	7.8	75	0.7	.	.	6.0	12	0.44	0.05	.	1850	190	.	.	.	135	.	23	.
89	GUM BRANCH	4	92	92	Current	2.9	0.5	300	1	8.4	85	.	.	21	5.9	8	0.52	0.07	0	.	94	.	.	.	70	.	34	.
90	DURBIN CREEK	4	92	92	Current	4.8	0.8	250	5	4.7	51	.	.	32	6.6	53	1.37	0.09	1	.	168	.	.	.	240	.	63	.
95	LONG BRANCH	3	92	92	Current	3.6	0.3	600	2	7.6	77	.	.	34	5.4	7	0.87	0.02	0	.	200	.	.	.	80	.	42	.
100	BIG DAVIS CREEK	3	92	92	Current	2.3	0.4	120	1	4.4	46	.	.	14	6.9	60	0.59	0.10	1	.	66	.	.	.	190	.	42	.
106	YELLOW WATER CREEK	3	92	92	Current	7.0	0.5	400	14	7.0	67	.	.	22	6.3	10	0.76	0.08	1	.	60	.	.	.	90	.	47	.
117	SAL TAYLOR CREEK	3	92	92	Current	3.5	0.5	150	3	7.0	72	.	.	15	6.4	27	1.11	0.07	1	.	32	.	.	.	120	.	34	.
129	FISHING CREEK	4	92	92	Current	10.8	0.3	50	18	4.9	57	.	.	11	6.3	77	2.49	0.48	9	.	92	.	.	.	170	.	63	.
133	ROWELL CREEK	3	92	92	Current	3.5	0.3	150	3	6.5	74	.	.	15	6.2	30	2.17	0.21	3	.	50	.	.	.	180	.	44	.
135	BUTCHER PEN CREEK	4	92	92	Current	8.9	0.3	55	22	5.0	57	.	.	12	6.6	88	1.14	0.21	66	.	1650	.	.	.	260	.	65	.
138	CALDWELL BRANCH	3	92	92	Current	3.3	0.5	500	1	5.2	56	.	.	26	5.8	7	0.90	0.01	1	.	42	.	.	.	90	.	41	.
144	ORTEGA RIVER	49	89	93	Current	3.4	0.8	108	4	3.2	34	1.3	.	12	6.6	42	0.88	0.10	1	920	123	.	.	.	236	.	49	.
154	POTTSBURG CREEK	4	92	92	Current	7.3	0.5	70	6	6.0	74	.	.	12	6.7	81	1.01	0.16	45	.	170	.	.	.	990	.	51	.
162	WILLIS BRANCH	5	92	92	Current	7.0	0.7	40	10	3.8	42	.	.	11	6.8	94	1.29	0.17	16	.	720	.	.	.	360	.	64	.
165	CEDAR RIVER	54	92	92	Current	7.8	0.7	50	5	3.6	40	.	.	11	7.0	105	0.87	0.19	14	.	1364	.	.	.	520	.	61	.
166	MCCOYS CREEK	15	92	92	Current	.	.	.	18	.	.	.	.	8	.	.	1.39	0.23	.	.	.	.	.	.	.	.	57	.
168	Arlington River	15	89	92	Current	4.8	0.5	60	25	7.9	83	.	.	12	7.8	76	1.09	0.17	32	718	300	.	.	.	19800	.	47	.
180	STRAWBERRY CREEK	4	92	92	Current	3.5	0.7	50	2	4.8	54	.	.	8	6.5	81	0.91	0.09	9	.	927	.	.	.	420	.	48	.
185	SIXMILE CREEK REACH	3	92	92	Current	4.9	0.3	100	4	5.9	64	.	.	14	6.8	53	0.65	0.10	1	.	570	.	.	.	180	.	50	.
188	LITTLE SIXMILE CREEK	5	92	92	Current	3.9	1.1	23	4	3.5	43	.	.	6	7.0	119	0.38	0.14	1	.	375	.	.	.	670	.	47	.
192	MONCRIEF CREEK	4	92	92	Current	18.0	0.4	40	32	5.0	58	.	.	10	6.8	97	1.24	0.24	31	.	664	.	.	.	3130	.	66	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
195	SJR AB DAMES PT	64	89	92	Current	6.4	0.6	56	18	6.8	74	1.1	.	.	7.2	.	0.92	0.10	3	.	.	.	.	.	20290	.	43	.
196	SJR AB TROUT R	300	89	93	Current	6.8	0.7	73	19	7.0	77	1.0	.	.	7.6	95	1.03	0.14	3	400	55	.	.	.	16365	.	44	.
203	SJR AB ICW	99	89	92	Current	6.0	0.7	59	26	6.7	73	1.3	.	.	7.4	.	0.64	0.10	3	46	28	.	.	.	31325	.	42	.
208	TROUT RIVER	41	89	92	Current	6.7	0.6	81	21	6.8	75	1.3	.	.	7.3	.	1.02	0.16	2	285	105	.	.	.	20329	.	45	.
212	BROWARD RIVER	29	90	91	Current	10.0	.	43	37	6.7	75	1.8	.	.	7.6	.	1.25	0.14	.	900	200	.	.	.	15089	.	56	.
215	LITTLE TROUT RIVER	50	91	91	Current	.	.	.	7	.	.	.	.	34	.	.	2.11	0.33	.	.	.	.	.	.	.	.	72	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: ESTUARY																
149	ICWW	FAIR	Current	0	.	0	0	0	x	x	0	0	0	.	.	0
197	SJR AB FULLER WARREN B	POOR	Current	0	.	x	0	.	0	x	0	0	0	.	0	x
198	SJR AB PINEY POINT	POOR	Current	0	.	0	0	.	0	x	0	0	0	.	0	x
207	SISTERS CREEK	FAIR	Current	0	.	0	0	0	0	x	0	0	0	.	.	0
					.			.			.			.	.	.
213	BROWNS CREEK	GOOD	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
* WATER BODY TYPE: LAKE																
3	Lake Disston	GOOD	Current	0	.	0	0	x	0	.	.	0	0	.	.	0
7	Crescent Lk	FAIR	Current	0	.	0	0	0	0	.	0	0	0	.	0	x
19	GRANDIN LAKE OUTLET	GOOD	Current	0	.	0	x	x	0	.	0	0	.	.	0	0
40	GEORGES LAKE	GOOD	Current	0	.	0	x	x	0	.	0	0	.	.	0	0
42	LAKE JOHNSON	GOOD	Current	0	.	0	x	x	0	.	0	0	0	.	0	0
43	BEDFORD LAKE	GOOD	Current	0	.	0	x	x	0	.	0	0	.	.	0	0
44	CRYSTAL LAKE	GOOD	Current	0	.	0	0	x	0	.	0	0	.	.	0	0
49	SJR AB PALMO CR	FAIR	Current	0	.	0	0	0	x	0	0	0	0	.	.	0
50	SJR AB TOCIO	FAIR	Current	0	.	0	0	0	0	0	0	0	0	.	0	x
51	SJR AB FEDERAL PT	FAIR	Current	0	.	0	0	0	0	.	0	0	0	.	0	0
58	KINGSLEY LAKE OUTLET	GOOD	Current	0	.	0	0	x	0	.	0	0	0	.	.	0
72	SJR AB BLACK CR	FAIR	Current	0	.	0	0	0	0	0	0	0	0	.	0	0
87	DOCTORS LAKE	FAIR	Current	0	.	0	0	0	0	x	0	0	0	.	0	x
199	SJR AB DOCTOR LAKE	FAIR	Current	0	.	0	0	.	0	x	0	0	0	.	.	x
200	SJR AB JULINGTON CR	FAIR	Current	0	.	0	0	0	0	0	0	0	0	.	0	0
* WATER BODY TYPE: STREAM																
1	Dunns Creek	GOOD	Current	0	0	.	0	0	0	0	0	0	0	0	0	0
2	ORTEGA RIVER	GOOD	Current	0	0	.	0	.	x	0	.	0	0	.	.	.
4	MIDDLE HAW CREEK	FAIR	Current	0	0	.	0	x	0	.	.	x	0	.	.	0
5	HAW CK AB CRESCENT LK	FAIR	Current	0	0	.	0	0	0	.	0	x	x	x	.	0
6	HAW CREEK	FAIR	Current	0	0	.	0	0	0	.	.	x	0	0	.	0
9	SJR ab Oklawaha River	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	.	0
11	BULL CREEK DITCHES	FAIR	Current	0	0	.	0	0	0	x	0	x	.	.	0	.
16	RICE CREEK	GOOD	Current	0	0	.	0	0	0	.	x	0	0	.	0	x
18	MILL BRANCH	POOR	Current	0	x	.	0	0	0	.	0	0	.	.	0	.
20	WEST RUN INTERCEPTER D	POOR	Current	0	0	.	0	0	0	x	0	0	.	.	0	x
25	RICE CREEK	POOR	Current	0	0	.	0	0	0	.	x	0	0	.	0	x
37	ETONIA CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	0
38	DEEP CREEK	POOR	Current	0	0	.	0	0	0	x	0	x	.	.	0	0
39	CEDAR CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	.	x
41	MOCCASIN BRANCH	FAIR	Current	0	0	.	0	0	0	.	0	0	.	.	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK: WQI OR TSI	DATA RECORD: CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
45	SIMMS CREEK	GOOD	Current	0	0	.	x	x	0	.	0	0	.	.	0	.
47	ATES CREEK	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
48	TOCOI CREEK	GOOD	Current	0	0	.	0	0	0	x	0	x	.	.	0	.
52	SJR AB RICE CR	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
54	GREENE CREEK	FAIR	Current	0	0	.	0	x	0	.	0	0	x	.	.	x
55	CLARKES CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	.	.	0	.
57	SIXMILE CREEK	FAIR	Current	0	0	.	0	0	0	0	0	0	.	.	0	0
60	Black Creek S.fork	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	x
61	PETERS CREEK	POOR	Current	0	0	.	0	x	0	.	0	x	0	.	0	x
62	MILL CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
67	TROUT CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
69	MILL CREEK	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	x
70	Black Creek S.fork	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	0
74	BLACK CK AB STJR	GOOD	Current	0	0	.	0	0	0	.	0	x	0	.	.	x
75	BIG BRANCH	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
77	BLACK CREEK	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	0
80	GROG BRANCH	FAIR	Current	0	0	.	0	0	0	.	0	0	0	.	0	0
82	CUNNINGHAM CREEK	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	0
83	LITTLE BLACK CREEK	FAIR	Current	0	0	.	0	x	0	.	x	x	0	.	0	x
84	NORTH FORK BLACK CREEK	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	.	0
88	NORTH FORK BLACK CREEK	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	.	0
89	GUM BRANCH	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	x
90	DURBIN CREEK	POOR	Current	0	0	.	0	0	0	.	x	0	0	.	0	0
95	LONG BRANCH	GOOD	Current	0	0	.	0	x	0	.	x	0	0	.	0	x
100	BIG DAVIS CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
106	YELLOW WATER CREEK	FAIR	Current	0	0	.	0	x	0	.	0	0	0	.	0	x
117	SAL TAYLOR CREEK	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
129	FISHING CREEK	POOR	Current	x	x	.	0	0	0	.	0	0	0	.	0	x
133	ROWELL CREEK	GOOD	Current	x	0	.	0	0	0	.	0	0	0	.	0	x
135	BUTCHER PEN CREEK	POOR	Current	0	0	.	0	0	x	.	0	0	x	.	x	x
138	CALDWELL BRANCH	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	x
144	ORTEGA RIVER	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	0
154	POTTSBURG CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	0	.	x	x
162	WILLIS BRANCH	POOR	Current	0	0	.	0	0	0	.	0	x	x	.	0	0
165	CEDAR RIVER	POOR	Current	0	0	.	0	0	0	.	0	x	x	.	0	0
166	MCCOYS CREEK	FAIR	Current	0	0	.	.	.	0	.	0	.	.	.	.	.
168	Arlington River	FAIR	Current	0	0	.	0	0	x	x	0	0	0	.	0	x
180	STRAWBERRY CREEK	FAIR	Current	0	0	.	0	0	0	.	0	0	x	.	0	0
185	SIXMILE CREEK REACH	FAIR	Current	0	0	.	0	0	0	.	0	0	x	.	0	x
188	LITTLE SIXMILE CREEK	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	0
192	MONCRIEF CREEK	POOR	Current	0	0	.	0	0	x	x	0	0	x	.	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
195	SJR AB DAMES PT	GOOD	Current	0	0	.	0	.	0	x	0	0	.	.	0	x
196	SJR AB TROUT R	GOOD	Current	0	0	.	0	0	x	x	0	0	0	.	0	x
203	SJR AB ICW	GOOD	Current	0	0	.	0	.	x	x	0	0	0	.	0	0
208	TROUT RIVER	FAIR	Current	0	0	.	0	.	x	x	0	0	0	.	0	x
212	BROWARD RIVER	FAIR	Current	0	0	.	0	.	x	x	0	0	0	.	.	.
215	LITTLE TROUT RIVER	POOR	Current	x	0	.	.	.	0	.	x	.	.	.	.	.

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SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

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1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
149	ICWW	PARTIAL	FAIR	0	x	x	+	.	.	+	.	+	0	.	.	+	0	0	0	+	.	
197	SJR AB FULLER WARREN B	NO	POOR	x	x	0	0	.	x	0	.	+	0	+	.	0	0	0	0	0	.	
198	SJR AB PINEY POINT	NO	POOR	0	x	0	+	.	0	0	.	+	0	+	.	0	0	+	+	0	.	
207	SISTERS CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
				.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
213	BROWNS CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: LAKE																						
3	Lake Disston	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	Crescent Lk	PARTIAL	FAIR	0	0	x	0	.	0	x	.	+	.	.	.	0	x	.	.	0	.	
19	GRANDIN LAKE OUTLET	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
40	GEORGES LAKE	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
42	LAKE JOHNSON	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
43	BEDFORD LAKE	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
44	CRYSTAL LAKE	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
49	SJR AB PALMO CR	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
50	SJR AB TOCIO	PARTIAL	FAIR	0	0	0	0	0	0	0	x	0	0	0	x	x	x	.	.	0	.	
51	SJR AB FEDERAL PT	PARTIAL	FAIR	x	0	x	0	.	x	0	.	+	.	.	.	0	0	.	.	+	.	
58	KINGSLEY LAKE OUTLET	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
72	SJR AB BLACK CR	PARTIAL	FAIR	0	0	x	+	0	0	0	0	+	+	0	.	0	0	0	+	x	.	
87	DOCTORS LAKE	PARTIAL	FAIR	0	0	x	0	0	0	0	0	0	0	+	.	0	0	0	0	0	.	
199	SJR AB DOCTOR LAKE	PARTIAL	FAIR	0	x	x	0	.	+	+	.	+	0	+	.	0	0	+	+	0	.	
200	SJR AB JULINGTON CR	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
1	Dunns Creek	YES	GOOD	0	0	x	+	0	0	0	0	0	0	0	0	0	0	.	.	0	.	
2	ORTEGA RIVER	YES	GOOD	0	0	.	0	.	.	0	.	+	0	.	.	0	0	0	0	0	.	
4	MIDDLE HAW CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
5	HAW CK AB CRESCENT LK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	HAW CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
9	SJR ab Oklawaha River	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
11	BULL CREEK DITCHES	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	RICE CREEK	YES	GOOD	0	0	x	0	+	0	0	0	0	0	0	.	0	0	.	.	0	.	
18	MILL BRANCH	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
20	WEST RUN INTERCEPTER D	NO	POOR	0	0	0	0	.	.	0	.	0	0	.	.	0	0	.	.	0	.	
25	RICE CREEK	NO	POOR	+	0	0	+	0	0	0	0	0	0	.	.	+	+	.	0	0	.	
37	ETONIA CREEK	YES	GOOD	+	+	+	+	0	.	0	+	0	+	+	.	+	+	.	.	0	.	
38	DEEP CREEK	NO	POOR	x	x	x	0	0	0	0	0	0	0	0	.	0	0	.	.	0	.	
39	CEDAR CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
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DO-DISSOLVED OXYGEN
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FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
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TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
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TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

SURFACE WATER QUALITY ASSESSMENT REPORT ** USGS HYDROLOGIC UNIT: 03080103 ST JOHNS RIVER, LOWER

TRENDS-SOURCES-CLEANUP

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WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
41	MOCCASIN BRANCH	PARTIAL	FAIR	0	0	0	0	.	.	0	.	0	0	.	.	0	0	.	.	0	.	
45	SIMMS CREEK	YES	GOOD	0	0	0	0	+	0	0	0	0	0	0	.	0	0	.	.	0	.	
47	ATES CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
48	TOCOI CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
52	SJR AB RICE CR	YES	GOOD	0	0	0	+	0	0	0	+	0	0	0	0	0	0	.	.	+	.	
54	GREENE CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
55	CLARKES CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
57	SIXMILE CREEK	PARTIAL	FAIR	0	0	0	0	0	.	0	0	0	x	0	0	0	0	.	.	0	.	
60	Black Creek S.fork	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
61	PETERS CREEK	NO	POOR	0	0	0	0	0	0	0	0	0	0	0	.	0	0	.	.	+	.	
62	MILL CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
67	TROUT CREEK	YES	GOOD	0	0	0	0	0	.	0	0	0	0	.	.	0	0	.	.	0	.	
69	MILL CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
70	Black Creek S.fork	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
74	BLACK CK AB STJR	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
75	BIG BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
77	BLACK CREEK	YES	GOOD	0	0	x	0	0	.	0	0	0	0	0	.	0	0	.	.	0	.	
80	GROG BRANCH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
82	CUNNINGHAM CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
83	LITTLE BLACK CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
84	NORTH FORK BLACK CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
88	NORTH FORK BLACK CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
89	GUM BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
90	DURBIN CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
95	LONG BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
100	BIG DAVIS CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
106	YELLOW WATER CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
117	SAL TAYLOR CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
129	FISHING CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
133	ROWELL CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
135	BUTCHER PEN CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
138	CALDWELL BRANCH	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
144	ORTEGA RIVER	PARTIAL	FAIR	0	+	0	+	0	0	0	0	0	x	0	.	0	0	+	0	+	.	
154	POTTSBURG CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
162	WILLIS BRANCH	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
165	CEDAR RIVER	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
166	MCCOYS CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
168	Arlington River	PARTIAL	FAIR	0	0	0	0	.	.	+	.	0	0	.	.	0	0	0	0	0	.	
180	STRAWBERRY CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
185	SIXMILE CREEK REACH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

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WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
188	LITTLE SIXMILE CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
192	MONCRIEF CREEK	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
195	SJR AB DAMES PT	YES	GOOD	0	0	x	0	.	.	x	.	+	+	0	.	x	x	.	.	0	.	
196	SJR AB TROUT R	YES	GOOD	0	+	0	0	0	0	0	.	0	0	0	.	0	0	0	0	0	.	
203	SJR AB ICW	YES	GOOD	0	0	x	0	.	.	0	.	0	+	0	.	x	x	0	0	0	.	
208	TROUT RIVER	PARTIAL	FAIR	0	0	0	0	.	.	0	.	0	0	0	.	x	x	0	0	0	.	
212	BROWARD RIVER	PARTIAL	FAIR	0	0	.	0	.	.	+	.	0	0	.	.	0	0	.	0	0	.	
215	LITTLE TROUT RIVER	NO	POOR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

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NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=ST JOHNS RIVER, LOWER HUC=03080103

MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
1	2606A	Dunns Creek	GOOD	THREAT	X	X																												X				
2	2213P	ORTEGA RIVER	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
7	2606B	Crescent Lk	FAIR	THREAT	X	X																												X				
8*	2625	LAKE STELLA OUTLET		THREAT	X	X	X		X	X	X			X							X	X	X		X						X			X				
9	22130	SJR ab Oklawaha River	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
10*	2623	SILVER LAKE OUTLET		THREAT	X	X																												X				
12*	2619	ACOSTA CREEK		GOOD																																		
13*	2616	CAMP BRANCH		GOOD																																		
14*	2611	HAMMOCK BRANCH		GOOD																																		
15*	2605	CROSS FLORIDA BARGE CA		THREAT		X	X			X																									X			
17*	2589	SIXTEENMILE CREEK		THREAT	X	X	X		X	X		X	X								X	X									X			X	X	X		
18	2592	MILL BRANCH	POOR	THREAT	X	X	X		X													X	X								X			X				
21*	2583	COW BRANCH		THREAT	X	X																												X				
22*	2585	UNNAMED DITCHES		THREAT	X	X	X		X																						X			X				
23*	2578	DOG BRANCH		THREAT	X	X																												X				
24*	2579	UNNAMED DITCHES		THREAT	X	X	X		X																						X			X				
26*	2571	UNNAMED DITCH		THREAT	X	X	X														X		X								X			X				
27*	2568	UNNAMED DITCH		THREAT	X	X	X		X																						X		X	X				
28*	2555	CRACKER BRANCH		THREAT	X	X	X	X	X			X	X								X		X								X		X	X	X	X		
29*	2563	UNNAMED DITCHES		THREAT	X	X	X		X																						X		X	X				
30*	2511A	SIMMS CREEK		THREAT			X	X															X									X			X			
31*	2562	UNNAMED DITCHES		THREAT	X	X	X	X	X												X		X								X		X	X	X			
32*	2564	UNNAMED DITCHES		THREAT	X	X	X		X																						X		X	X				
33*	2561	UNNAMED DITCHES		THREAT	X	X	X		X																						X		X	X				
34*	2559	UNNAMED DITCHES		THREAT			X																X										X					
35*	2543B	ETONIA CREEK		THREAT	X	X	X	X	X													X	X									X		X		X		
36*	2552	UNNAMED DITCHES		THREAT	X		X		X																						X		X					
37	2543A	ETONIA CREEK	GOOD	THREAT	X	X	X	X	X													X	X									X		X		X		
38	2549	DEEP CREEK	POOR	THREAT	X	X	X		X			X	X								X		X								X		X	X	X	X		
41	2540	MOCCASIN BRANCH	FAIR	THREAT	X	X	X	X	X			X	X								X		X								X		X	X		X		X
45	2511B	SIMMS CREEK	GOOD	THREAT			X	X															X									X			X			
46*	2522	UNNAMED CANAL		THREAT	X	X	X	X	X	X											X	X	X								X		X	X				
48	2492	TOCOI CREEK	GOOD	THREAT	X		X		X	X										X	X	X	X		X						X			X				
49	2213J	SJR AB PALMO CR	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
50	2213K	SJR AB TOCIO	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
51	2213L	SJR AB FEDERAL PT	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
52	2213N	SJR AB DUNNS CR	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
52	2213N	SJR AB RICE CR	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
56*	2495	TOWN BRANCH		THREAT	X	X																												X				
57	2411	SIXMILE CREEK	FAIR	THREAT	X	X			X	X		X	X							X	X	X		X		X					X			X		X		
59*	2474	UNNAMED DRAIN		THREAT	X	X			X																						X			X				
62	2460	MILL CREEK	FAIR	THREAT	X				X	X		X	X								X	X									X			X		X		
63*	2461	UNNAMED BRANCH		THREAT	X				X	X		X	X								X	X									X			X		X		X
64*	2453	PETTY BRANCH		THREAT	X			X	X	X											X												X	X	X			
65*	2450	MOLASSES BRANCH		THREAT																													X					
66*	2448	KENDALL CREEK		THREAT			X																										X					
67	2431	TROUT CREEK	GOOD	THREAT	X	X			X												X										X		X	X		X		X
68*	2443	ORANGE GROVE BRANCH		THREAT			X																										X					
71*	2436	KENTUCKY BRANCH		THREAT	X	X			X	X											X										X		X	X	X			

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CATNAME=ST JOHNS RIVER, LOWER HUC=03080103
(continued)

MAP ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
72	2213I	SJR AB BLACK CR	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
73*	2426	UNNAMED BRANCH		THREAT	X	X			X	X											X												X	X	X	X		
76*	2417	MILL CREEK		THREAT	X	X			X	X											X	X											X	X	X	X		
78*	2402	BOWEN BRANCH		THREAT	X			X	X												X										X		X					X
79*	2409	BIG LIGE BRANCH		THREAT	X	X																											X	X	X	X		
81*	2408	UNNAMED SLOUGH		THREAT				X		X																									X			
82	2404	CUNNINGHAM CREEK	FAIR	THREAT	X	X	X	X	X	X		X	X	X	X					X	X		X		X							X	X	X		X	X	
85*	2398	UNNAMED SLOUGH		THREAT				X		X																									X			
86*	2397	FLORA BRANCH		THREAT	X	X	X	X	X	X						X	X				X		X		X						X		X	X		X		
90	2365	DURBIN CREEK	POOR	THREAT	X	X	X	X	X	X						X	X				X		X		X								X	X		X		
91*	2381	CORMORANT CREEK		THREAT	X	X	X	X	X		X	X	X			X	X			X	X	X	X		X									X	X	X	X	X
92*	2385	MANDARIN DRAIN		THREAT	X	X	X	X	X		X	X	X			X	X			X	X	X	X		X									X	X	X	X	X
93*	2379	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
94*	2376	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
95	2342	LONG BRANCH	GOOD	THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
96*	2375	N. MEADOWBROOK TERR SL		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
97*	2382	UNNAMED DRAIN		THREAT	X	X	X	X	X		X	X	X			X	X			X	X	X	X		X									X	X	X	X	X
98*	2359	CAMP BRANCH		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
99*	2351	JULINGTON CREEK		FAIR	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X		X						X	X	X	X	X	X	X	X
100	2356	BIG DAVIS CREEK	GOOD	FAIR	X	X	X		X	X	X	X	X			X				X		X	X		X						X	X	X	X	X	X	X	X
101*	2369	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
102*	2358	UNNAMED BRANCH		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
103*	2367	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
104*	2361	DEEP BOTTOM CREEK		FAIR	X	X	X		X	X	X	X	X			X				X		X	X		X						X	X	X	X	X	X	X	X
105*	2362	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
106	2323	YELLOW WATER CREEK	FAIR	THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
107*	2350	SWEETWATER CREEK		FAIR	X	X	X		X	X	X	X	X			X				X		X	X		X						X	X	X	X	X	X	X	X
108*	2357	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
109*	2355	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
110*	2353	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
111*	2341	BOX BRANCH		THREAT	X	X																	X								X	X	X			X		X
112*	2349	MOORE BRANCH		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
113*	2352	UNNAMED RUN		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
114*	2344	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
115*	2283	PABLO CREEK		THREAT	X	X																	X								X	X	X			X		X
116*	2347	UNNAMED STREAM		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
117	2327	SAL TAYLOR CREEK	GOOD	THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
118*	2346	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
119*	2345	UNNAMED DITCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
120*	2343	UNNAMED STREAM		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
121*	2338	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
122*	2326	GOODBYS CREEK		THREAT	X	X	X	X	X		X	X	X			X	X			X	X	X	X		X									X	X	X	X	X
123*	2340	UNNAMED BRANCH		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
124*	2328	CABBAGE CREEK		THREAT	X				X							X					X				X								X	X	X	X	X	X
125*	2271	PUNCHEON GUM SWAMP		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
126*	2335	UNNAMED BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
127*	2334	VENETIAN TERRACE DITCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
128*	2333	UNNAMED DITCHES		THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X

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129	2324	FISHING CREEK	POOR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
130*	2336	OAK HILL PARK DITCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
131*	2332	UNNAMED DITCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
132*	2330	SO. TIGER HOLE SWAMP		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
133	2309	ROWELL CREEK	GOOD	THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
134*	2321	CHRISTOPHER BRANCH		THREAT	X	X	X	X	X	X	X	X	X			X	X			X	X	X		X	X									X	X		X	X
135	2322	BUTCHER PEN CREEK	POOR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
136*	2319	BENNETT BRANCH		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
137*	2312	NO. TIGER HOLE SWAMP		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
138	2310	CALDWELL BRANCH	GOOD	THREAT			X	X	X	X	X	X	X							X											X	X	X	X	X		X	X
139*	2302	RYALS SWAMP		THREAT	X	X																	X								X	X	X			X		X
140*	2317	UNNAMED DRAIN		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
141*	2306	NEW ROSE CREEK		THREAT	X	X	X	X	X	X	X	X	X			X	X			X	X	X		X	X									X	X		X	X
142*	2316	WILLIAMSON CREEK		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
143*	2315	UNNAMED DRAIN		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
144	2249A	ORTEGA RIVER	FAIR	THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
145*	2299	OPEN CREEK		THREAT					X							X									X								X	X	X	X	X	X
146*	2305	NORMANDY VILLAGE RUN		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
147*	2290	*CEDAR SWAMP CREEK*		THREAT	X	X																	X								X	X	X			X		X
148*	2308	UNNAMED DITCHES		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
149	2205C	ICWW	FAIR	THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
150*	2273	MILL DAM BRANCH		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
151*	2304	UNNAMED CREEK		THREAT	X	X	X	X	X	X	X	X	X			X	X			X	X	X		X	X									X	X		X	X
152*	2293	UNNAMED DRAIN		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
153*	2272	*UNNAMED DITCH*		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
154	2265B	POTTSBURG CREEK	FAIR	THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
155*	2277	WILLS BRANCH		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
156*	2284	LITTLE POTTSBURG CREEK		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
157*	2297	CRAIG CREEK		THREAT	X	X	X	X	X	X	X	X	X			X	X			X	X	X		X	X									X	X		X	X
158*	2295	SOUTHSIDE ESTATE DRAIN		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
159*	2294	*SPRING GLEN DRAIN*		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
160*	2287	MILLER CREEK		THREAT	X	X	X	X	X	X	X	X	X			X	X			X	X	X		X	X									X	X		X	X
161*	2280	BIG FISHWEIR CREEK		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X			X		X									X	X		X	X
162	2282	WILLIS BRANCH	POOR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
163*	2286	UNNAMED DITCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
164*	2278	SILVERSMITH CREEK		THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
165	2262	CEDAR RIVER	POOR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X									X	X	X	X	X
166	2262A	MCCOYS CREEK	FAIR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X									X	X	X	X	X
167*	2266	HOPKINS CREEK		THREAT					X							X									X								X	X	X	X	X	X
168	2265A	Arlington River	FAIR	THREAT	X	X		X	X	X	X					X				X	X		X		X							X		X	X	X	X	X
169*	2249B	McGirts Creek		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
170*	2257	MCCOY CREEK		POOR	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X									X	X	X	X	X
171*	2246	JONES CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
172*	2260	WHITEHOUSE BRANCH		THREAT	X	X			X			X	X			X	X						X		X									X	X	X	X	X
173*	2259	CAMBON BRANCH		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
174*	2248	GIN HOUSE CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
175*	2254	RED BAY BRANCH		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
176*	2252	HOG CREEK		POOR	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X									X	X	X	X	X

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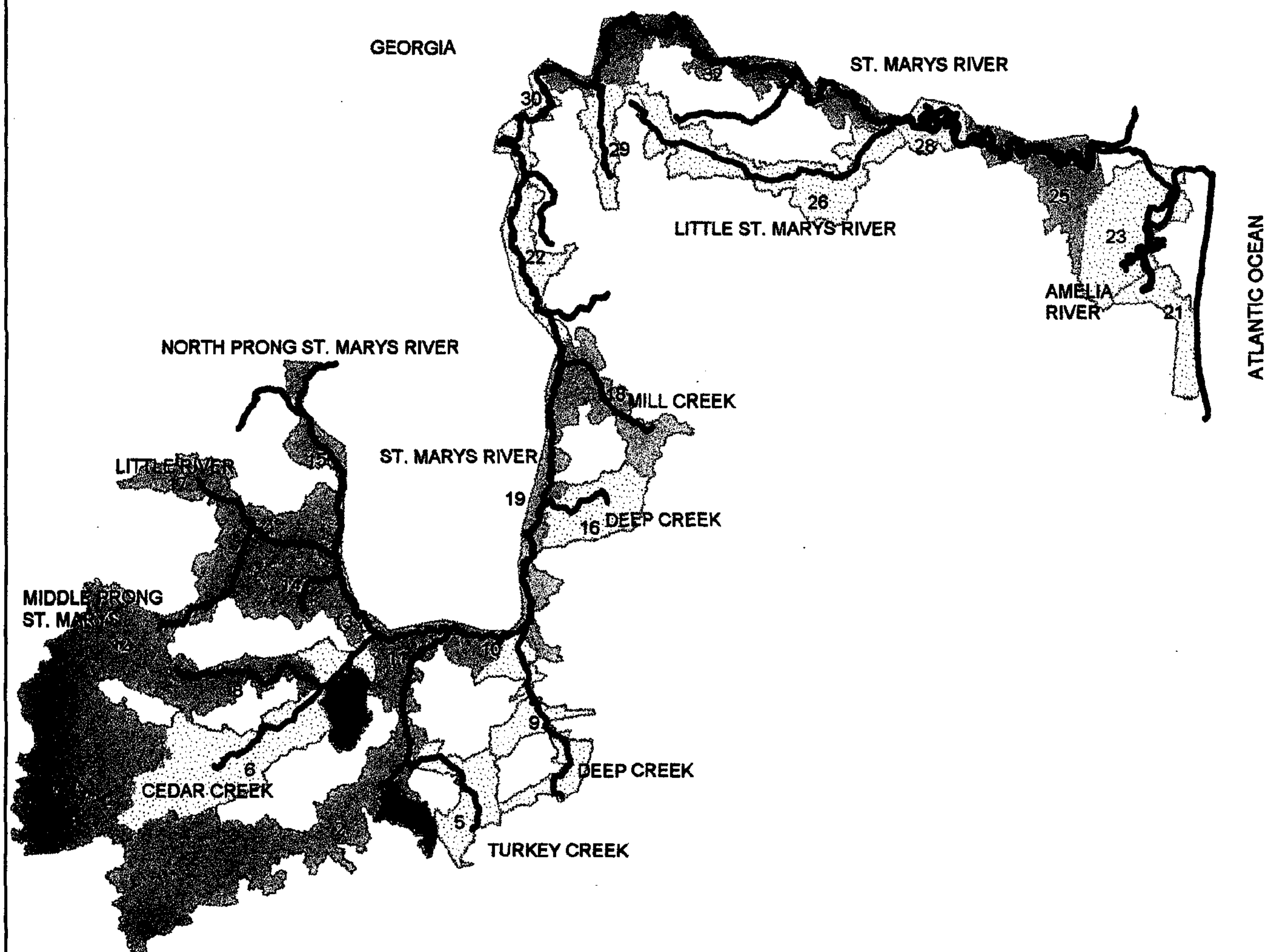
177*	2240	GREENFIELD CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
178*	2256	DEER CREEK		POOR	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X									X	X	X	X	X
179*	2244	COW HEAD CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
180	2239	STRAWBERRY CREEK	FAIR	THREAT	X	X	X		X		X					X																X		X	X	X	X	X
181*	2253	UNNAMED DITCHES		POOR	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X									X	X	X	X	X
182*	2243	AIRFIELD DRAIN		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
183*	2251	BULTS BAY		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
184*	2234	MOUNT PLEASANT CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
185	2232	SIXMILE CREEK REACH	FAIR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
186*	2237	TIGER POND CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
187*	2235	NEW CASTLE CREEK		THREAT	X	X	X		X		X					X																X		X	X	X	X	X
188	2238	LITTLE SIXMILE CREEK	FAIR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
189*	2233	LONG BRANCH		POOR	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X									X	X	X	X	X
190*	2227	SHERMAN CREEK		THREAT					X							X									X								X	X	X	X	X	X
191*	2231	UNNAMED BRANCH		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
192	2228	MONCRIEF CREEK	POOR	POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X	X	X									X	X		X	X
193*	2224	RIBAULT RIVER		POOR	X	X	X	X	X	X	X	X	X		X	X	X		X	X		X	X		X									X	X	X	X	X
194*	2221	BAY DRAIN		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
195	2213C	SJR AB DAMES PT	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
196	2213D	SJR AB TROUT R	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
197	2213E	SJR AB FULLER WARREN B	POOR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
198	2213F	SJR AB PINEY POINT	POOR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
199	2213G	SJR AB DOCTOR LAKE	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
200	2213H	SJR AB JULINGTON CR	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
201*	2223	UNNAMED BRANCH		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
202*	2220	NINEMILE CREEK		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
203	2213B	SJR AB ICW	GOOD	FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
204*	2213A	SJR ab mouth		FAIR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X		X			X				X		X	X	X	X	X
205*	2218	DRUMMOND DREEK		THREAT	X	X	X	X	X	X	X	X	X		X	X		X		X					X									X	X	X	X	X
206*	2216	NICHOLS CREEK		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
207	2205A	SISTERS CREEK	FAIR	THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
208	2203	TROUT RIVER	FAIR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
209*	2207	BLOCK HOUSE CREEK		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
210*	2204	TERRAPIN CREEK		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
211	2205B	CEDAR POINT CREEK	POOR	THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
212	2191	BROWARD RIVER	FAIR	THREAT	X	X	X	X	X	X	X	X	X		X	X		X		X					X									X	X	X	X	X
213	2209	BROWNS CREEK	GOOD	THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
214*	2210	WEST BRANCH		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
215	2206	LITTLE TROUT RIVER	POOR	FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
216*	2200	HALF CREEK		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
217*	2201	GULLEY BRANCH		FAIR	X	X	X	X	X	X	X	X	X		X	X	X		X				X		X						X	X	X	X	X	X	X	X
218*	2188	CLAPBOARD CREEK		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
219*	2181	DUNN CREEK		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
220*	2186	LITTLE CEDAR CREEK		THREAT	X	X	X	X	X	X	X	X	X		X	X		X		X					X									X	X	X	X	X
221*	2189	RUSHING BRANCH		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
222*	2187	BEEGHLY HEIGHTS DRAIN		THREAT	X	X	X	X	X	X	X	X	X		X	X		X		X					X									X	X	X	X	X
223*	2183	CANEY CREEK		THREAT	X				X							X		X		X											X	X	X	X	X	X	X	X
224*	2190	AIR NAT GUARD DITCH		THREAT	X	X	X	X	X	X	X	X	X		X	X		X		X					X									X	X	X	X	X



ST. MARY'S RIVER BASIN
03070204

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN

ST. MARYS RIVER BASIN

Basic Facts

Drainage Area: 1,610 square miles (about 60% in Florida)
Major Land Uses: forest
Population Density: low (Fernandina Beach, Macclenny)
Major Pollution Sources: WWTP, pulp mills
Best Water Quality Areas: upper regions of St. Marys River
Worst Water Quality Areas: John Row Branch
Water Quality Trends: stable quality at 4 sites, improving water quality at mouth of St. Marys and degrading water quality just upstream
OFW Waterbodies:
Okefenokee National Wildlife Refuge
Ft. Clinch State Aquatic Preserve
SWIM Waterbodies: none
Reference Reports:
Coastal Area BAS, DEP (Jacksonville), 1987
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DEP (Tallahassee), 1988
Biological Assessment of Container Corporation of America, DEP January, 1992
Biological Assessment of ITT Rayonier, Inc., DEP, December, 1991
Basin Water Quality Experts:
John Hendrickson, SJRWMD, 904/329-4370
Lee Banks, DEP (Jacksonville), 904/448-4300

In the News

* The U.S. House passed and sent to President Bush legislation authorizing the National Park Service to study the St. Marys River to determine if sections should be protected as part of the National Wild and Scenic River System. The Final Draft of the study was published for public comment in December 1993. The study found some portions of the river eligible and suitable for the designation. It includes recommendations on who to manage the protected areas.

Ecological Characterization

The St. Marys River has its origins in the Okefenokee and associated swamps in the western portion of the basin. The average flow of the river is about 1,200 cfs. This remote blackwater stream forms the northeast border between Florida and Georgia. There is little development in the upper basin. Where accessible, land use is primarily silviculture. A small urban and agricultural area exists in the South Prong drainage. The lower portion of the St. Marys River is tidally influenced and reverse flows occur daily. Amelia River forms the estuarine portion of the basin and has a drainage area of approximately 5 square miles.

Anthropogenic Impacts

The St. Marys River with its extensive marsh system generally has excellent water quality. There are three areas of concern in the basin: the South Prong, Little St. Marys, and Amelia River. The basin, upstream of Boulogue, is generally characterized by naturally high color, low pH and low DO.

The South Prong, in the past, has shown minor problems with high bacteria and nutrient concentrations, possibly due to agricultural impacts and to the effluents from the Macclenny WWTP and the Northeast Florida State Hospital WWTP. Both effluents discharge to Turkey Creek, a tributary of the South Prong.

Finally, the Amelia River estuary has historically exhibited fair water quality with DO, water clarity and nutrient problems. The Fernandina Beach WWTP discharges directly to the Amelia River. Two Florida, one Georgia pulp paper mills, and urban runoff from rapidly developing Fernandina Beach and Amelia Island also affect the water quality. More recent data indicates the DO problem has been reduced. Also, the City of St. Marys on the Georgia border is growing rapidly, related to the Kings Bay Naval Base and the paper industry. A site specific alternative criterion of 3.2 mg/l dissolved oxygen has been issued for the Amelia River in the vicinity of the ITT Rayonnier (paper mill) discharge point during certain tidal flows. Additionally, high ammonia-ammonium concentrations are being found in the Fernandina Beach area.

** USGS HYDROLOGIC UNIT: 03070204 ST MARYS RIVER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: ESTUARY																												
21	JACKSON CREEK	63	90	93	Current	5.1	0.9	38	26	6.6	70	1.3	.	.	7.7	109	0.68	0.07	.	50	41	3.3	.	.	37138	.	.	58
23	AMELIA RIVER	37	90	92	Current	4.2	1.0	45	24	5.7	65	1.3	.	6	7.5	110	0.65	0.08	5	71	6	.	.	.	45850	.	.	54
27	St. Marys Riv AB ICWW	21	92	93	Current	5.9	0.8	53	35	6.5	71	1.4	.	.	7.6	99	0.69	0.05	.	68	12	.	.	.	42250	.	.	60
* WATER BODY TYPE: LAKE																												
1	HAMPTON LAKE	11	90	91	Current	3.3	0.7	200	7	5.1	57	1.2	.	14	5.7	7	0.81	0.05	8	235	20	.	.	.	68	.	.	60
3	OCEAN POND OUTLET	52	80	80	Historical	5.0	0.6	.	.	8.0	84	.	.	.	.	.	0.42	0.05	.	.	.	.	.	.	46	.	.	57
* WATER BODY TYPE: STREAM																												
2	SOUTH PRONG ST. MARYS	18	90	91	Current	6.6	0.4	195	3	6.0	65	1.0	.	16	6.0	24	0.95	0.13	1	520	120	.	.	.	103	.	37	.
4	JOHN ROW BRANCH	4	80	80	Historical	4.5	0.3	85	33	3.3	33	18.5	89	.	7.0	.	5.43	3.85	.	166E3	12650	.	.	.	245	.	83	.
5	TURKEY CREEK	5	93	93	Current	4.7	0.5	100	4	2.7	30	.	.	11	5.7	36	0.41	.	4	.	280	.	.	.	104	.	48	.
6	CEDAR CREEK	10	90	91	Current	9.9	.	418	3	6.6	69	1.4	.	19	5.4	14	1.40	0.14	0	.	.	.	.	.	88	.	47	.
8	CALKINS CREEK	3	92	92	Current	1.8	0.3	400	1	5.6	66	.	.	36	4.5	1	0.86	0.02	1	.	44	.	.	.	60	.	41	.
9	DEEP CREEK	3	92	92	Current	6.3	0.3	400	3	3.7	44	.	.	27	6.0	9	1.24	0.19	1	.	40	.	.	.	90	.	58	.
10	St. Marys River	104	70	86	Historical	2.0	0.6	200	5	7.7	82	0.8	.	23	5.3	3	0.79	0.05	.	175	65	.	.	.	50	280	33	.
11	St. Marys River	46	89	93	Current	2.3	0.4	320	3	6.8	78	1.3	.	.	4.9	2	0.92	0.04	1	240	20	.	2.6	19	58	.	31	.
12	MIDDLE PRONG ST. MARYS	25	90	93	Current	2.7	0.2	441	2	6.5	71	1.1	.	38	5.3	12	0.93	0.04	1	334	100	.	.	.	78	.	34	.
13	St. Marys River	3	92	92	Current	2.6	0.4	600	2	7.4	79	.	.	43	3.7	1	1.02	0.02	1	.	20	.	.	.	70	.	34	.
14	BLUFF CREEK	3	92	92	Current	4.0	0.2	400	1	8.3	83	.	.	29	4.5	2	0.58	0.02	0	.	210	.	.	.	40	.	38	.
15	St. Marys R. N. Prong	39	90	93	Current	1.3	0.4	450	3	5.5	57	1.0	.	64	3.8	1	1.19	0.04	0	308	25	.	3.3	12	84	.	34	.
16	DEEP CREEK	4	92	92	Current	2.8	0.3	600	4	1.3	14	.	.	35	4.9	2	1.21	0.04	2	.	51	.	.	.	70	.	56	.
17	LITTLE RIVER	3	92	92	Current	3.0	0.2	600	2	6.0	63	.	.	55	3.5	1	1.21	0.02	0	.	20	.	.	.	90	.	40	.
18	MILL CREEK	3	92	92	Current	2.1	0.3	500	1	5.2	54	.	.	30	4.6	1	0.87	0.02	0	.	56	.	.	.	70	.	43	.
19	St. Marys River	33	90	93	Current	3.3	0.6	263	6	6.7	75	1.6	.	.	6.0	7	0.93	0.06	.	273	27	.	.	.	71	.	37	.
20	DEEP CREEK	3	92	92	Current	4.3	0.5	600	2	1.6	19	.	.	42	4.2	2	1.22	0.05	1	.	157	.	.	.	60	.	62	.
22	St. Marys River	3	92	92	Current	4.0	0.4	500	6	6.1	68	.	.	33	5.0	1	0.99	0.07	0	.	32	.	.	.	55	.	47	.
24	DUNN CREEK	3	92	92	Current	3.6	0.3	600	3	3.9	47	.	.	30	4.2	4	0.90	0.11	1	.	827	.	.	.	50	.	63	.
25	St. Marys River	25	92	93	Current	6.1	0.9	75	23	6.5	71	1.0	.	.	7.4	81	0.86	0.07	.	40	12	.	.	.	34750	.	33	.
26	LITTLE ST. MARYS RIVER	9	92	93	Current	4.8	0.5	243	4	2.4	28	.	.	24	5.9	31	1.28	0.04	8	.	114	.	.	.	135	.	59	.
28	St. Marys River	40	89	93	Current	5.7	0.6	275	10	5.5	56	0.9	.	29	6.1	9	0.97	0.06	2	338	85	.	.	.	1180	.	47	.
29	PIGEON CREEK	12	92	93	Current	6.7	0.5	205	4	5.9	62	1.5	.	18	5.2	5	0.53	0.03	0	1575	368	.	1.7	14	50	.	47	.
30	St. Marys River	2	92	92	Current	6.3	0.4	450	5	5.8	69	.	.	32	5.5	5	0.95	0.06	1	.	42	.	.	.	55	.	49	.
31	CABBAGE CREEK	3	92	92	Current	7.0	0.2	400	3	1.8	22	.	.	32	5.7	11	1.41	0.05	1	.	154	.	.	.	100	.	65	.
32	St. Marys River	67	89	93	Current	3.4	0.6	250	5	4.5	53	1.1	.	26	6.0	7	1.04	0.06	0	373	50	.	.	.	75	.	43	.

LEGEND:

ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03070204 ST MARYS RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: ESTUARY																
21	JACKSON CREEK	FAIR	Current	0	.	0	0	0	x	x	0	0	0	0	.	0
23	AMELIA RIVER	FAIR	Current	0	.	0	0	0	x	x	0	0	0	.	0	0
27	St. Marys Riv AB ICWW	UNKN	Current	0	.	0	0	0	x	x	0	0	0	.	.	0
* WATER BODY TYPE: LAKE																
1	HAMPTON LAKE	FAIR	Current	0	.	0	0	x	0	.	0	0	0	.	0	x
3	OCEAN POND OUTLET	GOOD	Historical	0	.	0	.	.	0	.	.	0	.	.	.	x
* WATER BODY TYPE: STREAM																
2	SOUTH PRONG ST. MARYS	GOOD	Current	0	0	.	0	0	0	.	0	0	0	.	0	x
4	JOHN ROW BRANCH	POOR	Historical	x	x	.	0	.	x	.	x	x	x	.	.	x
5	TURKEY CREEK	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	x
6	CEDAR CREEK	FAIR	Current	0	0	.	0	x	0	.	0	0	.	.	0	.
8	CALKINS CREEK	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
9	DEEP CREEK	FAIR	Current	0	0	.	0	x	0	.	0	x	0	.	0	x
10	St. Marys River	GOOD	Historical	0	0	.	0	x	0	.	0	0	0	.	.	x
11	St. Marys River	GOOD	Current	0	0	.	x	x	0	.	0	0	0	0	0	x
12	MIDDLE PRONG ST. MARYS	GOOD	Current	0	0	.	0	x	0	.	x	0	0	.	0	x
13	St. Marys River	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
14	BLUFF CREEK	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
15	St. Marys R. N. Prong	GOOD	Current	0	0	.	x	x	0	.	x	0	0	0	0	x
16	DEEP CREEK	FAIR	Current	0	0	.	x	x	0	.	x	x	0	.	0	x
17	LITTLE RIVER	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
18	MILL CREEK	GOOD	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
19	St. Marys River	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	.	x
20	DEEP CREEK	UNKN	Current	0	0	.	x	x	0	.	x	x	0	.	0	x
22	St. Marys River	FAIR	Current	0	0	.	x	x	0	.	x	0	0	.	0	x
24	DUNN CREEK	UNKN	Current	0	0	.	x	x	0	.	x	x	x	.	0	x
25	St. Marys River	GOOD	Current	0	0	.	0	0	x	x	0	0	0	.	.	0
26	LITTLE ST. MARYS RIVER	FAIR	Current	0	0	.	0	0	0	.	0	x	0	.	0	x
28	St. Marys River	FAIR	Current	0	0	.	0	x	0	0	x	0	0	.	0	x
29	PIGEON CREEK	FAIR	Current	0	0	.	0	x	0	.	0	0	0	x	0	x
30	St. Marys River	FAIR	Current	0	0	.	0	x	0	.	x	0	0	.	0	x
31	CABBAGE CREEK	UNKN	Current	0	0	.	0	x	0	.	x	x	0	.	0	x
32	St. Marys River	GOOD	Current	0	0	.	0	x	0	.	0	0	0	.	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03070204 ST MARYS RIVER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

<--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	1984 - 1993 TRENDS: OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
21	JACKSON CREEK	PARTIAL	FAIR	x	x	x	0	.	0	0	.	+	0	0	.	0	0	0	.	0	.	
23	AMELIA RIVER	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
27	St. Marys Riv AB ICWW	NO	UNKN	0	x	0	+	.	0	0	.	0	0	0	.	0	0	.	.	0	.	
* WATER BODY TYPE: LAKE																						
1	HAMPTON LAKE	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	OCEAN POND OUTLET	YES	GOOD																			
* WATER BODY TYPE: STREAM																						
2	SOUTH PRONG ST. MARYS	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4	JOHN ROW BRANCH	NO	POOR																			
5	TURKEY CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	CEDAR CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
8	CALKINS CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
9	DEEP CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
10	St. Marys River	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
11	St. Marys River	YES	GOOD	0	0	x	+	0	0	+	0	+	0	0	.	0	0	0	+	0	.	
12	MIDDLE PRONG ST. MARYS	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
13	St. Marys River	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
14	BLUFF CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
15	St. Marys R. N. Prong	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	DEEP CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
17	LITTLE RIVER	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
18	MILL CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
19	St. Marys River	YES	GOOD	0	0	0	0	.	.	0	0	0	0	0	.	0	0	.	.	0	.	
20	DEEP CREEK	NO	UNKN	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
22	St. Marys River	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
24	DUNN CREEK	NO	UNKN	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
25	St. Marys River	YES	GOOD	+	+	0	+	.	0	0	.	0	0	0	.	0	+	.	.	0	.	
26	LITTLE ST. MARYS RIVER	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
28	St. Marys River	PARTIAL	FAIR	x	0	x	0	0	0	0	0	0	0	0	.	x	x	.	.	0	.	
29	PIGEON CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
30	St. Marys River	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
31	CABBAGE CREEK	NO	UNKN	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
32	St. Marys River	YES	GOOD	0	0	0	0	0	.	0	0	0	0	0	0	x	x	.	0	0	.	

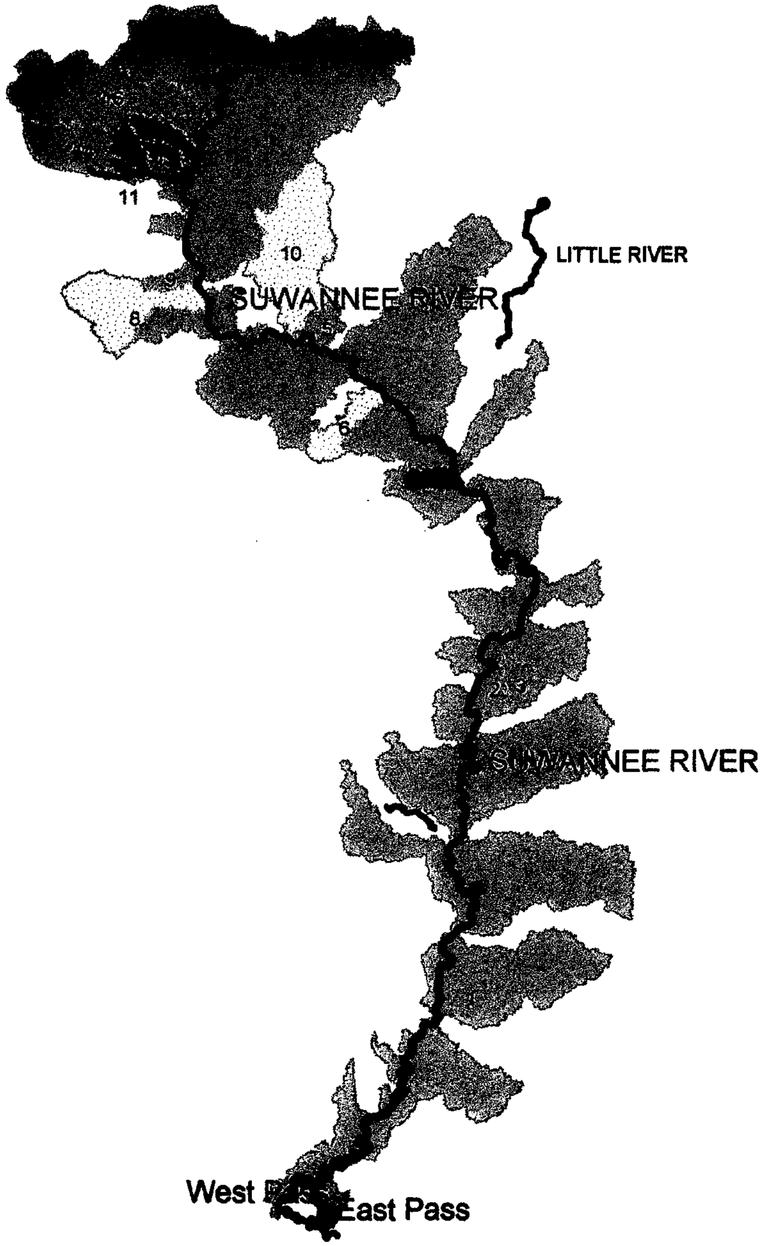
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES *NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED*
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=ST MARYS RIVER HUC=03070204

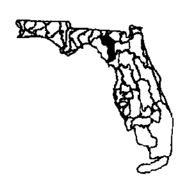
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
3	2339	OCEAN POND OUTLET	GOOD	THREAT						X																								X				
6	2242	CEDAR CREEK	FAIR	THREAT	X																										X		X			X	X	X
7*	2268	SCOUT POND DRAIN		THREAT																											X		X			X		X



LOWER SUWANNEE RIVER BASIN
03110205

AVERAGE WATER QUALITY
1984-1994 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES NPS ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



LOWER SUWANNEE RIVER BASIN

Basic Facts

Drainage Area: 1,596 square miles
Major Land Uses: forestry, agriculture
Population Density: low (Live Oak, Branford, Chiefland)
Major Pollution Sources: poultry processing facility, dairy and agriculture operations
Best Water Quality Areas: Lower Suwannee River
Worst Water Quality Areas: Owens Spring
Water Quality Trends: stable quality at one site, improving quality in Suwannee River
OFW Waterbodies: Suwannee River, Lower Suwannee National Wildlife Refuge
SWIM Waterbodies: Suwannee River System
Reference Reports:
Suwannee River System SWIM Plan, SRWMD, 1991
Limnology of the Suwannee River, DEP (Tallahassee), 1985
Analysis of Trends in Water Quality in the Suwannee River Basin, USGS, 1988
Suwannee River Floodplain Onsite Sewage Disposal System Inventory Annual Report 1991, HRS/SRWMD, 1991
Florida Rivers Assessment, DEP/FREAC/NPS, 1989
District Lakes Assessment, SRWMD Technical Report, 1991.
Review and Development of Water Quality Criteria for the Suwannee River, University of Florida, 1992
Basin Water Quality Experts:
Robert Mattson, SRWMD, 904/362-1001
Gray Bass, FGFWFC, 904/957-4172
Jerry Krummrich, FGFWFC, 904/758-0525

In the News

* A 10-20 year flood occurred on the Suwannee River during the late winter of 1991.
* The Dixie County Board of County Commissioners passed a county ordinance, creating a Water and Sewer District for the Town of Suwannee in November, 1992. In doing so the town is moving toward centralized WWTP and removal of septic tanks.
* A major winter storm, known as the Storm of the Century, impacted the Suwannee River late winter of 1993.
* DER released PRFT monies to Suwannee River Water Management District in November 1991 for the restoration of Ruth Springs, Royal Springs and the tidal shore line of the Town of Suwannee. Restorations were completed in August 1993.

Ecological Characterization

The Suwannee River, with an average flow of 11,000 cfs, is one of Florida's largest, relatively unspoiled rivers, and one of its most treasured. From its headwaters in the Okeefenokee Swamp, it travels 245 miles to the Gulf of Mexico. The Lower Suwannee River Basin begins at the junction of the Withlacoochee River where the Suwannee River renews its southerly course. From the headwaters, the downstream increase in flow reflects not only the larger drainage area but also a major contribution of ground water from the Floridan Aquifer through springs along the river's course. The lower river also receives flow from two major tributaries: the Withlacoochee River with a discharge of 1,600 cfs, and the Santa Fe River with an average flow of 2,000 cfs.

Most of the Suwannee River flows through excessively well-drained soils, thus there is relatively little overland drainage and few tributaries. Instead, water percolates through the soil and into the ground water. Conduits of the karst terrain account for the numerous springs. The springs can be thought of as tributaries of exceptionally good water quality, however, when the river is under flood conditions, it covers the springs and a reverse flow occurs. The springs drain the river water which causes impact to the groundwater.

Because of its drainage characteristics, the land may not be well suited for agriculture and dairy operations. There is concern that the impacts of dairies and other high intensity agricultural operations will degrade ground water. Monitoring wells, as part of the DEP/SRWMD VISA Network, are being sampled. The basin is sparsely populated and there are only a few communities adjacent to the river. Below Fanning Springs, the river passes into the lower coastal areas which are primarily forested swamp land where silviculture is the major land use. The Town of Suwannee lies next to the estuary. Manatees are found in the lower reaches of the Suwannee River.

Anthropogenic Impacts

The Suwannee River has been designated an Outstanding Florida Water and is considered to be one of the State's treasures. Water quality is generally good in all reaches of the lower Suwannee River. Phosphorus is contributed by mining operations, which are located in the upper Suwannee River basin. Over the past decade total phosphorus concentrations have been declining. In addition, Gold Kist, Inc., poultry processing plant discharges below the confluence of the Withlacoochee River. There are a few other pollution sources in the basin such as septic tanks and dairies.

The Withlacoochee basin has several pollution problems. It receives a considerable sediment, nutrient, and possibly pesticide loading from agricultural runoff. Additionally, several WWTPs discharge to the Withlacoochee in Georgia. The Withlacoochee also receives effluent from a pulp mill in Georgia via Jumping Gully Creek. Eutrophication, however, is not a severe problem in the Suwannee because of the rapid flushing of the system and the spring inflow to the river. The effects of this enrichment on the receiving estuary, Suwannee Sound, have not been determined. The lower river is threatened by housing developments within the floodplain. The Town of Suwannee relies entirely on septic tanks for wastewater treatment. A 1991 HRS study of on-site septic tanks found that most of the septic tank systems were inadequate. Additionally, the town is built on a low lying, swampy area connected with a network of drainage canals. A past study by the Northeast DEP District indicated that the Town had an extensive bacteriological impact on the area due to chronic wastewater leachate problems. Nearby shellfishing areas are frequently closed due to high bacteria values. The Town recently created a Water and Sewer District which will facilitate its efforts to obtain a centralized wastewater treatment plant.

** USGS HYDROLOGIC UNIT: 03110205 SUWANNEE RIVER, LOWER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: LAKE																												
7	MORGAN LAGOON	3	90	90	Current	.	.	.	.	.	.	56.0	.	.	6.9	.	210.05	2.00	.	.	399E3	.	.	.	2680	.	.	100
* WATER BODY TYPE: SPRING																												
3	ROCK BLUFF SPRING	4	92	92	Current	0.2	8.5	3	2	3.0	32	.	.	.	7.5	125	1.02	0.06	.	.	.	.	.	.	275	.	44	.
6	OWENS SPRING	2	92	92	Current	0.2	5.0	3	2	1.8	18	.	.	.	7.3	155	3.33	0.05	.	.	.	.	.	.	376	.	53	.
8	BLUE SPRING	8	91	93	Current	.	.	.	.	1.9	22	0.5	.	.	7.3	.	1.90	0.05	.	.	.	.	.	.	383	103	51	.
9	ALLEN MILL POND DRAIN	3	92	92	Current	0.2	.	3	2	0.1	2	.	.	.	7.3	185	0.58	0.06	.	.	.	.	.	.	413	.	43	.
10	PEACOCK SLOUGH	3	92	92	Current	0.2	.	3	2	2.6	27	.	.	.	7.4	155	2.31	0.06	.	.	.	.	.	.	371	.	52	.
* WATER BODY TYPE: STREAM																												
1	SUWANNEE RIVER (LOWER)	218	89	93	Current	2.2	1.1	140	3	6.5	70	1.0	.	14	7.2	83	0.92	0.13	1	85	.	.	.	.	259	.	34	.
2	SUWANNEE RIVER (LOWER)	46	89	93	Current	1.6	1.1	175	3	6.5	67	0.8	.	15	7.3	81	1.03	0.15	1	96	.	.	.	.	211	.	33	.
5	SUWANNEE RIVER (LOWER)	245	89	93	Current	2.6	0.9	183	3	6.2	67	1.0	.	19	7.0	73	0.97	0.20	1	95	16	.	.	.	194	4980	34	.
11	BETHEL CREEK	4	93	93	Current	2.6	.	400	4	7.3	76	.	.	27	7.2	108	0.66	0.04	.	.	.	.	.	.	198	.	36	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT ** USGS HYDROLOGIC UNIT: 03110205 SUWANNEE RIVER, LOWER
MEDIAN VALUES FOR EACH WATERSHED SCREENED

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK: WQI OR TSI	DATA RECORD: CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: LAKE																
7	MORGAN LAGOON	UNKN	Current	x	.	x	0	.	.	x	x	.	x	.	.	.
* WATER BODY TYPE: SPRING																
3	ROCK BLUFF SPRING	GOOD	Current	0	0	.	0	0	0	0	.	x	.	.	.	0
6	OWENS SPRING	FAIR	Current	x	0	.	0	0	0	0	.	x	.	.	.	0
8	BLUE SPRING	FAIR	Current	0	0	.	0	.	.	.	0	x	.	.	.	.
9	ALLEN MILL POND DRAIN	GOOD	Current	0	0	.	0	0	0	0	.	x	.	.	.	.
10	PEACOCK SLOUGH	FAIR	Current	x	0	.	0	0	0	0	.	x	.	.	.	.
* WATER BODY TYPE: STREAM																
1	SUWANNEE RIVER (LOWER)	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
2	SUWANNEE RIVER (LOWER)	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
5	SUWANNEE RIVER (LOWER)	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
11	BETHEL CREEK	GOOD	Current	0	0	.	0	0	0	0	0	0	.	.	.	.

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
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WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03110205 SUWANNEE RIVER, LOWER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: LAKE																						
7	MORGAN LAGOON	NO	UNKN	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: SPRING																						
3	ROCK BLUFF SPRING	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	OWENS SPRING	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
8	BLUE SPRING	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
9	ALLEN MILL POND DRAIN	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
10	PEACOCK SLOUGH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
1	SUWANNEE RIVER (LOWER)	YES	GOOD	+	0	+	+	0	0	0	x	0	0	0	x	x	x	+	.	0	0	
2	SUWANNEE RIVER (LOWER)	YES	GOOD	0	0	0	+	.	0	0	x	0	0	.	0	0	0	0	.	0	.	
5	SUWANNEE RIVER (LOWER)	YES	GOOD	+	0	+	+	.	0	x	x	0	0	.	x	0	0	+	0	+	0	
11	BETHEL CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
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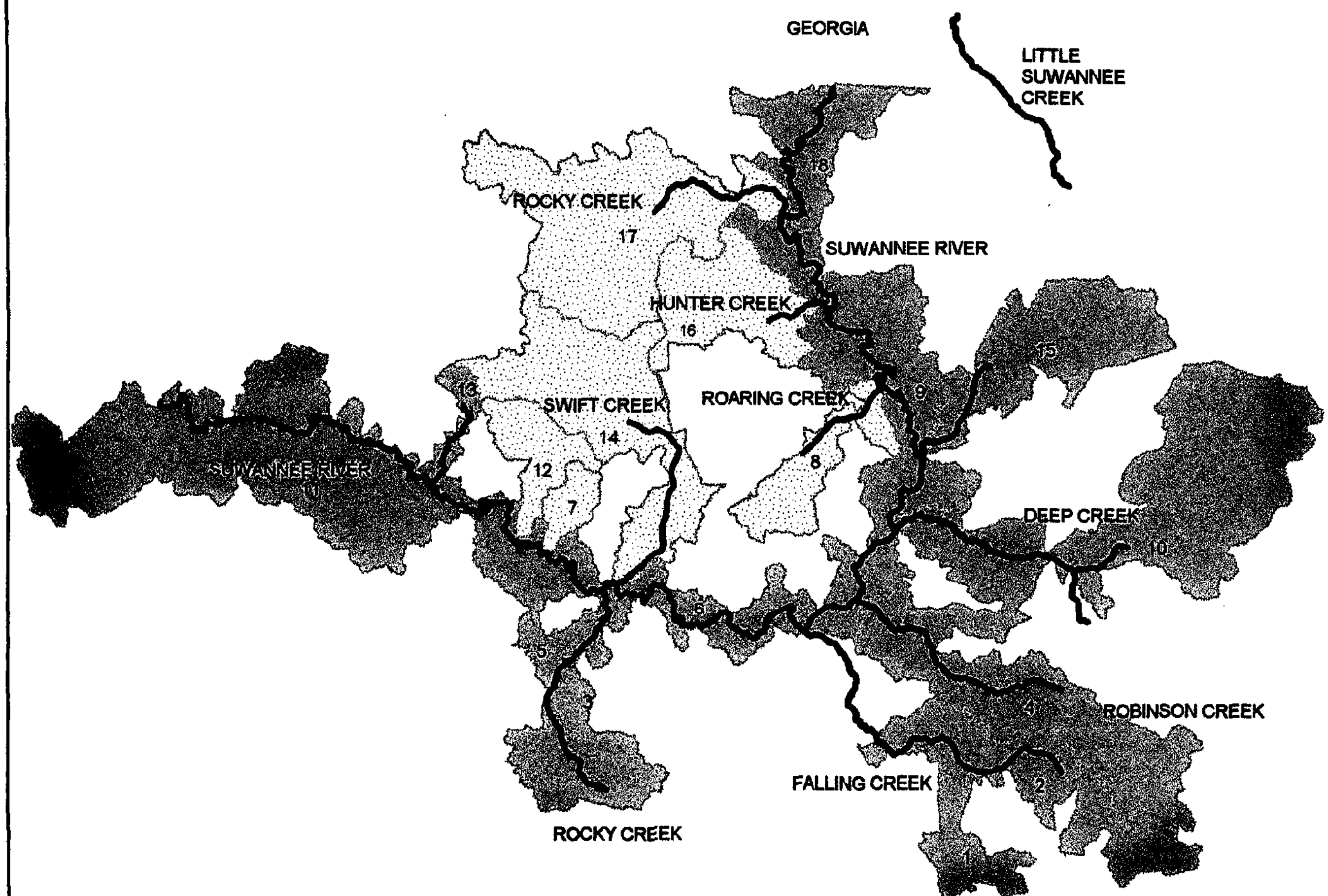
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=SUWANNEE RIVER, LOWER HUC=03110205

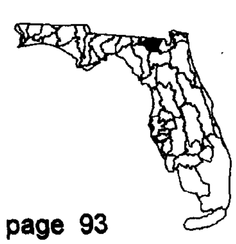
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
1	3422A	SUWANNEE RIVER (LOWER)	GOOD	THREAT	X	X	X	X								X		X				X		X							X		X	X	X			X
2	3422	SUWANNEE RIVER (LOWER)	GOOD	THREAT	X	X	X	X								X		X				X		X							X		X	X	X			X
4*	3597	UNNAMED SLOUGH		THREAT	X	X										X								X							X							
5	3422B	SUWANNEE RIVER (LOWER)	GOOD	THREAT	X	X	X	X								X		X				X		X							X		X	X	X			X
6	3568	OWENS SPRING	FAIR	THREAT	X	X										X								X							X							
11	3480	BETHEL CREEK	GOOD	THREAT			X				X					X																	X					
12*	3476	WILLIAM WATERHOLE DR		THREAT			X				X					X																	X					
13*	3472	BETHEL CREEK		THREAT			X				X					X																	X					
14*	3471	UNNAMED DITCH		GOOD																																		
15*	3469	SPRINGHEAD CREEK		THREAT			X				X					X																	X					
16*	3439	UNNAMED DRAIN		GOOD																																		



UPPER SUWANNEE RIVER BASIN
03110201

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN



UPPER SUWANNEE RIVER BASIN

Basic Facts

Drainage Area: 1,273 square miles
Major Land Uses: forest, agriculture, mining
Population Density: low (Ellaville, White Springs)
Major Pollution Sources: mining activities, chemical processing
Best Water Quality Areas: Sugar Creek, Robinson Creek, Upper Suwannee River
Worst Water Quality Areas: Swift Creek and Camp Branch
Water Quality Trends: stable quality at 8 sites, improving quality at Swift Creek, Rocky Cr., Falling Cr., and Suwannee R below White Springs
OFW Waterbodies: Suwannee River
SWIM Waterbodies:
Alligator Lake (Columbia County)
Falling Creek (Columbia County)
Upper Suwannee River including the Withlacochee River and all tributaries as part of Suwannee River System
Reference Reports:
Suwannee River System SWIM Plan, SRWMD, 1991
Analysis of Trends in Water Quality in the Suwannee River Basin, USGS, 1988
The Limnology of the Suwannee River, DER (Tallahassee), 1985
Florida Rivers Assessment, DNR/FREAC/NPS, 1989
District Lakes Assessment, SRWMD Technical Report, 1991
Review and Development of Water Quality Criteria for the Suwannee River, University of Florida, 1992
Biological Assessment of Occidental Chemical Corp., DEP, July, 1992
EPA Report for Monitoring Associated with "Four Point Agreement" Volume I & II, Environmental Services & Permitting, Inc. February 1988, for Occidental Chemical Corp
Basin Water Quality Experts:
Robert Mattson, SRWMD, 904/362-1001
Ron Ceryak, Nolan Col, SRWMD, 904/362-1001
Gray Bass, FGFWFC, 904/957-4172
Jerry Krummrich, FGFWFC, 904/758-0525

In the News

* The Nature Conservancy has purchased an additional 610 acres in the Pinhook Swamp area.
* DEP permitted a new discharge point for Occidental Chemical in Camp Branch in 1991. The discharge is essentially rainfall runoff which falls in the watershed from dewatering operation during mining.
* Health advisories recommending limited consumption of largemouth bass due to mercury content have been issued for the Suwannee River. The

health advisories remain in effect and research is being conducted on the problem.
* A 10-20 year flood occurred during the winter of 1991.
* In 1993, DEP established two new biological reference sites on Deep Creek and Robinson Creek.
* Occidental chemical is currently conducting a quarterly biological integrity sampling program for the Upper Suwannee River Basin.
* A major winter storm known as the Storm of the Century impacted the basin in March, 1993.

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Ecological Characterization

The Suwannee River is one of Florida's least developed and least polluted large rivers, and as such, is one of its most treasured resources. The upper Suwannee River basin drains portions of Florida and Georgia, encompassing a total area of 9,950 square miles. Approximately 926 miles of the drainage area are located in north central Florida; the remainder of the watershed drains parts of south central Georgia. Traveling a total distance of 265 miles from the headwaters, the Suwannee River ultimately discharges into the Gulf of Mexico. Below White Springs, the Suwannee River and its principal tributaries (Alapaha River, Withlacoochee River, and Santa Fe River) are fast-flowing streams with deep channels underlain by karst topography and characterized by numerous sinks and springs.

Headwaters of the upper Suwannee River near Fargo, Georgia, are formed by the convergence of numerous channels flowing from the southwest corner of the Okeefenokee Swamp. Consequently, the river at this point is very darkly stained and acidic. Flow measured below the swamp averages 1,800 cfs. Average daily flow 30 miles above the mouth of the Suwannee is 11,000 cfs, making it the second largest (by flow) river in Florida. The southward flowing river turns sharply westward near White Springs, Florida, near the Cody Scarp. The Alapaha and Withlacoochee Rivers originate in Georgia and join the Suwannee River as it renews its southward course. The average discharge rate of the Alapaha River and the Withlacoochee is 1,600 cfs/each. At low flow the Alapaha River is captured by a sinkhole. It is believed to discharge to the Suwannee River through Alapaha Rise Spring. This area also receives substantial flow from the Floridan Aquifer through numerous springs.

Land use in the upper Suwannee River basin is primarily silviculture and agriculture. There is also substantial drainage of swamp lands. The basin is sparsely populated and White Springs is the only community actually located on the river. Watersheds and headwaters of Hunter Creek, Roaring Creek, Four-mile Branch, Swift Creek, and Camp Branch are currently being mined for phosphates.

Anthropogenic Impacts

The Suwannee River is an Outstanding Florida Water and sections of the river have very good water quality. The Florida portion of the Upper Suwannee River Basin is surrounded by the Alapaha River Basin to the west, the Lower Suwannee River Basin and the Santa Fe River Basin to the south, and the St. Mary's River Basin to the east. In generally exhibits low pH, high color and low conductivity. These conditions are typical of waters draining swampland.

A large number of point source discharges to tributaries of the river are located in Georgia. These include municipal and industrial WWTP's, paper mill effluent, and effluent from aluminum product manufacturing. The river receives a large loading of phosphates, organic nitrogen, sulfates, and fluorides at Swift Creek from Occidental Chemical Company. The elevated nutrient values are evident downstream until they become diluted from flows of the Withlacoochee and Alapaha Rivers and several springs. Hunter Creek, which also receives Occidental effluent, exhibits high phosphorus values. Coliform levels are high in Roaring Creek, Swift Creek, Hunters Creek and the Suwannee River area above and below the confluence of Swift Creek. The original stream channel of Roaring Creek is being mined for phosphates. A new channel has been created. Occidental has been permitted a new discharge point at Camp Branch. The discharge consists of excess water from rainfall runoff in the watershed and from dewatering operations during mining. The excess water is routed to previously mined pits or reclaimed areas for clarification before being discharged to Camp Branch.

A detailed study of the entire Suwannee River was published by the Department of Environmental Regulation in 1985. It emphasized the marked difference in the upper and lower rivers, predominantly caused by a drastic pH change (from about 4 to 7) in the area of the Withlacoochee/Alapaha Rivers resulting from the inflow of the springs. Aside from the water quality changes associated with the ground water inflow, mining and phosphate beneficiation operations had the greatest impact on water quality. The upper Suwannee River is a SWIM priority water. Since 1989, an extensive surface water quality and biological monitoring program of the river and its tributaries has been performed by the SRWMD and their contractors. HRS is conducting an assessment of on-site septic tank systems compliance within the floodplain of the river. Finally, a water quality study conducted by the University of Florida defined ambient water quality. This study will be useful in the future determination of water quality for both existing and future discharges to the river.

Additional threats to the upper river are construction runoff, shoreline modification and septic tank seepage from residential development within the floodplain. However, at this point; the river is sparsely developed. A proposal for a large campground and trailer park was recently withdrawn. Agricultural land use may threaten springs within the river basin. Water quality threats from the Withlacoochee River are covered in the Lower Suwannee Basin.

** USGS HYDROLOGIC UNIT: 03110201 SUWANNEE RIVER, UPPER

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

WATERSHED ID	NAME	WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
		MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: LAKE																												
1	WATERTOWN LAKE	5	80	80	Historical	.	2.1	20	.	.	.	.	.	.	8.3	74	0.64	0.03	20	.	.	.	.	.	153	.	.	48
5	LAKE LOUISE	3	80	80	Historical	.	1.9	43	.	.	.	.	.	.	6.5	5	0.59	0.03	5	.	.	.	.	.	47	.	.	42
* WATER BODY TYPE: STREAM																												
2	FALLING CREEK	75	89	93	Current	1.4	0.4	313	3	5.0	53	1.0	.	36	4.8	5	1.06	0.17	2	109	.	.	.	.	64	.	42	.
3	ROCKY CRK NR WELLBORN	50	79	86	Historical	1.4	0.4	500	3	5.3	59	1.0	223	31	4.4	4	1.35	0.27	2	395	70	.	.	.	68	6	42	.
4	ROBINSON CREEK	55	89	93	Current	1.2	0.4	263	3	5.0	53	1.4	.	44	6.1	30	0.89	0.19	1	290	141	.	3.0	9	104	.	43	.
6	SUWANNEE RIVER (UPPER)	155	89	93	Current	1.1	0.6	388	3	7.0	77	1.2	.	45	4.3	5	1.17	0.18	1	105	.	.	.	.	66	.	37	.
7	JERRY BRANCH	6	89	90	Current	1.8	0.3	350	3	4.0	41	1.1	.	49	4.3	1	1.72	0.48	1	303	.	.	.	.	84	.	50	.
8	ROARING CREEK	46	89	93	Current	6.5	0.3	350	7	7.3	81	1.0	.	50	5.0	5	1.39	0.33	4	240	.	.	.	.	70	.	48	.
9	SUWANNEE RIVER (UPPER)	84	89	93	Current	1.4	0.6	350	3	7.1	72	1.0	.	47	3.9	5	1.15	0.11	2	90	.	.	.	.	65	.	34	.
10	DEEP CREEK	55	89	93	Current	0.8	0.4	488	3	5.2	55	1.3	.	50	4.3	5	1.12	0.17	1	290	143	.	2.1	12	67	.	42	.
11	SUWANNEE RIVER (UPPER)	134	89	93	Current	2.0	0.8	275	3	5.3	55	1.1	.	26	6.8	42	0.86	0.40	1	90	.	.	.	.	145	.	44	.
12	CAMP BRANCH	38	89	93	Current	1.6	0.4	300	3	4.5	49	1.0	.	35	6.3	50	1.06	0.90	2	830	.	.	.	.	94	.	53	.
13	SUGER CREEK	4	93	93	Current	2.4	.	80	5	8.9	92	.	.	9	7.2	38	3.41	0.70	.	.	.	.	.	.	168	.	38	.
14	SWIFT CREEK	46	89	93	Current	3.8	0.4	45	8	6.0	63	1.8	.	13	7.0	70	2.27	4.75	8	270	.	.	.	.	384	.	49	.
15	LITTLE CREEK	4	93	93	Current	0.2	0.5	300	2	7.0	70	.	.	36	5.0	5	1.02	0.21	.	.	.	.	.	.	51	.	43	.
16	HUNTER CREEK	58	89	93	Current	2.7	0.2	200	3	6.2	66	1.0	.	22	6.7	37	1.27	0.75	1	740	.	.	.	.	140	.	47	.
17	ROCKY CREEK NR BENTON	46	89	93	Current	0.8	0.4	550	3	4.6	51	1.3	.	75	3.9	5	1.52	0.20	2	140	.	.	.	.	90	.	49	.
18	SUWANNEE RIVER (UPPER)	13	89	90	Current	1.5	0.5	340	1	6.2	69	0.9	.	.	3.9	1	0.86	0.07	1	395	.	.	.	.	62	.	28	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110201 SUWANNEE RIVER, UPPER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK (WQI OR TSI)	DATA RECORD (CURRENT OR HISTORICAL)	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: LAKE																
1	WATERTOWN LAKE	GOOD	Historical	0	.	0	0	0	.	.	.	.	.	.	0	0
5	LAKE LOUISE	GOOD	Historical	0	.	0	0	x	.	.	.	.	.	.	0	0
* WATER BODY TYPE: STREAM																
2	FALLING CREEK	GOOD	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
3	ROCKY CRK NR WELLBORN	GOOD	Historical	0	0	.	x	x	0	.	x	0	0	.	0	x
4	ROBINSON CREEK	GOOD	Current	0	0	.	0	0	0	0	x	0	0	0	0	x
6	SUWANNEE RIVER (UPPER)	GOOD	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
7	JERRY BRANCH	FAIR	Current	0	x	.	x	x	0	.	x	0	0	.	0	x
8	ROARING CREEK	FAIR	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
9	SUWANNEE RIVER (UPPER)	GOOD	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
10	DEEP CREEK	GOOD	Current	0	0	.	x	x	0	0	x	0	0	0	0	x
11	SUWANNEE RIVER (UPPER)	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
12	CAMP BRANCH	FAIR	Current	0	x	.	0	0	0	0	x	0	0	.	0	x
13	SUGER CREEK	GOOD	Current	x	x	.	0	0	0	0	0	0	.	.	.	.
14	SWIFT CREEK	FAIR	Current	x	x	.	0	0	0	0	0	0	0	.	0	x
15	LITTLE CREEK	GOOD	Current	0	0	.	x	x	0	0	x	0	.	.	.	x
16	HUNTER CREEK	FAIR	Current	0	x	.	0	0	0	0	0	0	0	.	0	x
17	ROCKY CREEK NR BENTON	FAIR	Current	0	0	.	x	x	0	0	x	0	0	.	0	x
18	SUWANNEE RIVER (UPPER)	GOOD	Current	0	0	.	x	x	0	.	0	0	0	.	0	x

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT ** USGS HYDROLOGIC UNIT: 03110201 SUWANNEE RIVER, UPPER

TRENDS-SOURCES-CLEANUP

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	1984 - 1993 TRENDS: OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: LAKE																						
1	WATERTOWN LAKE	YES	GOOD																			
5	LAKE LOUISE	YES	GOOD																			
* WATER BODY TYPE: STREAM																						
2	FALLING CREEK	YES	GOOD	+	0	0	0	.	.	0	0	+	+	.	0	0	0	.	.	+	.	
3	ROCKY CRK NR WELLBORN	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4	ROBINSON CREEK	YES	GOOD	0	x	0	0	.	+	0	0	0	0	0	0	0	0	0	.	0	.	
6	SUWANNEE RIVER (UPPER)	YES	GOOD	+	0	0	+	.	0	0	0	+	+	0	0	0	0	+	.	+	0	
7	JERRY BRANCH	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
8	ROARING CREEK	PARTIAL	FAIR	0	0	0	0	.	0	x	0	x	0	0	0	0	0	0	.	0	0	
9	SUWANNEE RIVER (UPPER)	YES	GOOD	0	0	x	0	.	0	0	0	0	0	0	x	0	0	0	.	+	0	
10	DEEP CREEK	YES	GOOD	0	0	0	0	.	0	x	0	0	0	0	0	0	0	0	.	0	.	
11	SUWANNEE RIVER (UPPER)	YES	GOOD	0	0	0	+	.	0	0	x	0	x	0	0	0	x	0	.	+	0	
12	CAMP BRANCH	PARTIAL	FAIR	0	0	0	0	.	0	0	0	0	0	.	0	+	+	.	.	0	.	
13	SUGER CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
14	SWIFT CREEK	PARTIAL	FAIR	+	+	+	0	0	x	+	0	+	0	+	0	+	0	+	.	+	0	
15	LITTLE CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	HUNTER CREEK	PARTIAL	FAIR	0	0	x	0	0	0	0	0	0	0	0	0	0	x	0	.	0	0	
17	ROCKY CREEK NR BENTON	PARTIAL	FAIR	+	0	0	+	.	0	0	0	0	0	.	0	+	+	.	.	+	.	
18	SUWANNEE RIVER (UPPER)	YES	GOOD	0	0	0	0	0	0	0	0	0	0	0	.	0	0	0	.	0	.	

<--- PLEASE READ THESE COLUMNS VERTICALLY

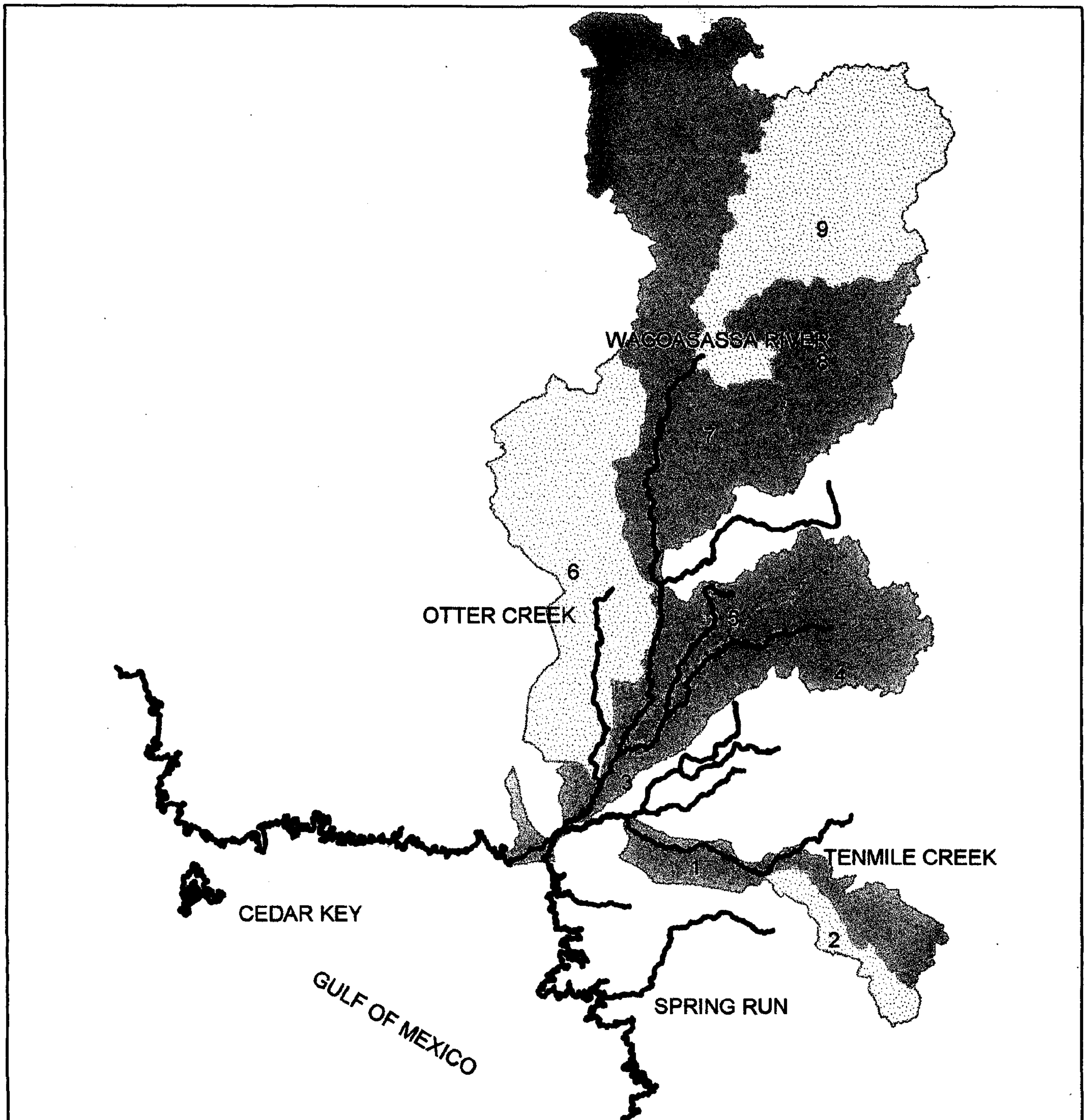
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=WITHLACOOCHEE RIVER,NORTH HUC=03110203

MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	CR	CN	HM	OT
1*	3366	LAKE FRANCIS		THREAT	X		X	X							X	X	X				X										X		X	X	X		X	X
2	3315	WITHLACOOCHEE RIVER	GOOD	THREAT	X		X		X																						X		X	X				X
3	3322	LAKE CHERRY	GOOD	THREAT	X		X		X	X																					X		X	X		X		X



WACCASASSA RIVER BASIN
03110101

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
- GOOD
- THREATENED
- FAIR
- POOR
- UNKNOWN

WACCASASSA RIVER BASIN

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Basic Facts

Drainage Area: 936 square miles
Major Land Uses: forest, wetlands
Population Density: low (Cedar Key, Bronson)
Major Pollution Sources: none
Best Water Quality Areas: Waccasassa River
Worst Water Quality Areas: Horsehole Cr. and Little Waccasassa River
Water Quality Trends: improving quality in the upper Waccasassa River
OFW Waterbodies: Big Bend Seagrasses State Aquatic Preserve
SWIM Waterbodies: Waccasassa River System
Reference Reports:
 Waccasassa River System SWIM Plan, SRWMD, 1991
 Florida Rivers Assessment, DNR/FREAC/NPS, 1989
 Florida Nonpoint Source Assessment, DER (Tallahassee), 1988
Basin Water Quality Experts:
 Gray Bass, FGFWFC, 904/957-4172
 Homer Royals, FGFWFC, 904/357-6631
 Ernest Estevez, Ph.D., Mote Marine Laboratory, 813/388-4441
 Rob Mattson, SRWMD, 904/362-1001
 Lee Banks, DEP, 904/448-4300

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In the News

* Land use in Waccasassa Flats is an issue between Gilchrist County residents and the County Commission. The most recent comprehensive plan for the county allows one shed per 80 acres or one house per 160 acres. Some local residents want no development.
* The Town of Cedar Key has applied for a Wastewater Treatment Plant permit, which is expected to be issued in December, 1993.

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Ecological Characterization

The Waccasassa River Basin drains 936 square miles of forest land and wetland between the Suwannee and South Withlacoochee Rivers. The river is 29 miles long and has an average flow of approximately 300 cfs. Blue Spring, at the headwaters, and several other small springs, supply ground water to the river. However, much of its flow is swamp and woodland drainage, thus giving it the typical blackwater color. The river empties into the Gulf of Mexico via a large coastal Juncus marsh. There are no major urban areas in the basin; however, one of the barrier islands, Cedar Key, is a developed recreational and historical site.

Anthropogenic Impacts

This basin has very good water quality and few sources of pollution. The only point source in the basin is the Cedar Key WWTP. Forestry clear-cutting in the basin could be a potential nonpoint source of pollution.

** USGS HYDROLOGIC UNIT: 03110101 WACCASASSA RIVER

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED		WATERSHED DATA RECORD				WATER CLARITY				DISSOLVED OXYGEN		OXYGEN DEMAND			PH ALKALINITY		TROPHIC STATUS			COLIFORM		BIOLOGICAL SPECIES DIVERSITY			COND	FLOW	WATER QUALITY INDICES	
ID	NAME	MAX #OBS	BEG YR	END YR	DATA PERIOD	TURB	SD	COLOR	TSS	DO	DOSAT	BOD	COD	TOC	PH	ALK	NITRO	PHOS	CHLA	TOTAL	FECL	NAT	ART	BECK	COND	FLOW	WQI	TSI
* WATER BODY TYPE: ESTUARY																												
3	WACCASASSA RIVER	91	70	85	Historical	3.5	1.5	30	7	5.7	70	0.8	.	5	7.3	109	0.40	0.06	7	.	.	.	.	.	420	306	.	38
* WATER BODY TYPE: LAKE																												
8	UNNAMED SLOUGH	49	70	70	Historical	4.0	.	50	.	4.2	52	.	.	.	5.0	0	1.31	0.02	.	.	.	.	.	.	28	.	.	37
* WATER BODY TYPE: SPRING																												
4	WEKIVA RIVER	34	70	85	Historical	2.0	.	3	.	5.0	57	0.5	.	1	7.5	79	0.20	0.04	.	.	.	.	.	.	169	57	36	.
* WATER BODY TYPE: STREAM																												
1	TENMILE CREEK	22	89	92	Current	2.2	0.4	195	3	5.5	64	1.1	.	26	7.2	96	0.69	0.07	1	290	.	.	.	.	197	.	38	.
2	HORSEHOLE CREEK	50	70	72	Historical	7.0	.	.	.	2.9	33	.	.	16	.	.	0.72	0.05	.	.	.	.	.	.	137	0	56	.
5	MULE CREEK	10	87	88	Historical	2.2	0.5	123	4	7.1	78	1.0	.	.	7.0	78	0.62	0.14	1	3346	555	3.1	.	30	151	.	33	.
6	OTTER CREEK	5	87	88	Historical	2.7	1.0	210	4	4.9	55	1.2	.	.	6.4	56	1.10	0.09	1	2375	288	.	.	.	151	.	48	.
7	WACCASASSA RIVER	64	89	93	Current	1.6	1.1	65	3	6.2	68	1.0	.	12	7.5	114	0.55	0.05	1	659	160	.	.	.	322	.	27	.
9	LITTLE WACCASASSA RIVE	100	70	77	Historical	0.6	.	140	.	4.8	54	1.9	.	30	6.2	2	0.76	0.03	.	.	.	.	.	.	84	1	58	.

LEGEND:

ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT
MEDIAN VALUES FOR EACH WATERSHED SCREENED

** USGS HYDROLOGIC UNIT: 03110101 WACCASASSA RIVER

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

SCREENING VARIABLES AND CRITERIA

WATERSHED ID	NAME	RANK (WQI OR TSI)	DATA RECORD (CURRENT OR HISTORICAL)	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: ESTUARY																
3	WACCASASSA RIVER	GOOD	Historical	0	.	0	0	0	0	0	0	0	.	.	0	0
* WATER BODY TYPE: LAKE																
8	UNNAMED SLOUGH	GOOD	Historical	0	.	0	x	x	0	.	.	0	.	.	.	.
* WATER BODY TYPE: SPRING																
4	WEKIVA RIVER	GOOD	Historical	0	0	.	0	0	0	.	0	0	.	.	.	.
* WATER BODY TYPE: STREAM																
1	TENMILE CREEK	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	x
2	HORSEHOLE CREEK	FAIR	Historical	0	0	.	.	.	0	.	0	x	.	.	.	.
5	MULE CREEK	GOOD	Historical	0	0	.	0	0	0	.	0	0	x	0	0	x
6	OTTER CREEK	FAIR	Historical	0	0	.	0	0	0	.	0	0	0	.	0	0
7	WACCASASSA RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	.	0	0
9	LITTLE WACCASASSA RIVE	FAIR	Historical	0	0	.	0	x	0	.	x	0	.	.	.	.

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

SURFACE WATER QUALITY ASSESSMENT REPORT
TRENDS-SOURCES-CLEANUP

** USGS HYDROLOGIC UNIT: 03110101 WACCASASSA RIVER

'x'=DEGRADING TREND
'0'=STABLE TREND
'+'=IMPROVING TREND
'.'=MISSING DATA

1984 - 1993 TRENDS <--- PLEASE READ THESE COLUMNS VERTICALLY

WATERSHED ID	NAME	QUALITY RANK: MEETS USE ?	QUALITY RANK: WQI OR TSI	OVER-ALL TREND	WQI or TSI	TN	TP	CHLA	SD	PH	ALK	TURB	TSS	BOD	TOC	DO	DOSAT	TCOLI	FCOLI	TEMP	FLOW	DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
* WATER BODY TYPE: ESTUARY																						
3	WACCASASSA RIVER	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: LAKE																						
8	UNNAMED SLOUGH	YES	GOOD																			
* WATER BODY TYPE: SPRING																						
4	WEKIVA RIVER	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
* WATER BODY TYPE: STREAM																						
1	TENMILE CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
2	HORSEHOLE CREEK	PARTIAL	FAIR																			
5	MULE CREEK	YES	GOOD	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	OTTER CREEK	PARTIAL	FAIR	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	WACCASASSA RIVER	YES	GOOD	+	0	0	+	0	0	0	+	+	0	0	.	0	0	0	.	+	.	
9	LITTLE WACCASASSA RIVE	PARTIAL	FAIR																			

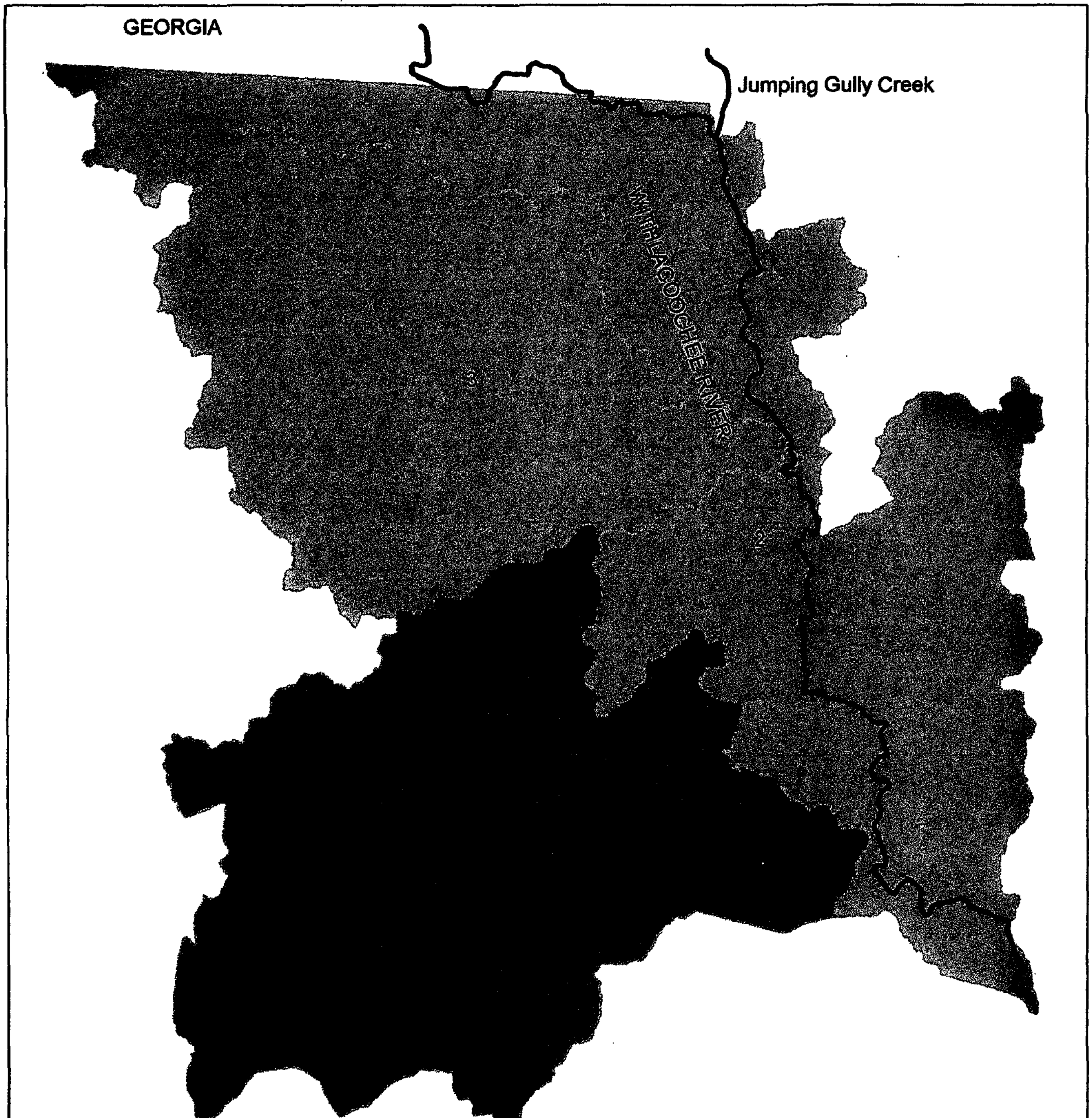
LEGEND:

ALK-ALKALINITY
BOD-BIOCHEM. OXYGEN DEMAND
CHLA-CHLOROPHYLL
DO-DISSOLVED OXYGEN
DOSAT-DO SATURATION
FCOLI-FECAL COLIFORM
FLOW-FLOW
MEETS USE-MEETS DESIGNATED USE
PH-PH
SD-SECCHI DISC METERS
TCOLI-TOTAL COLIFORM
TEMP-TEMPERATURE
TN-NITROGEN
TOC-T.ORGANIC CARBON
TP-PHOSPHORUS
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS

NPS QUALITATIVE SURVEY RESULTS
AN "X" INDICATES A PROBLEM WITH POLLUTANT OR SOURCE
THE * ON MAPID INDICATES NO STORET INFORMATION AVAILABLE FOR THIS WATERSHED
-SEE PAGE 11 FOR LEGEND FOR THIS TABLE-

CATNAME=APALACHICOLA RIVER HUC=03130011

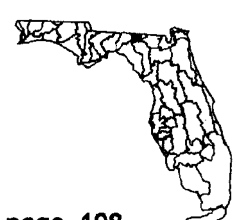
MAP_ID	WBID	BASIN	WQ305	WQNPS	NUTRIENT	BACTERIA	SEDIMENT	OIL	PESTICID	OTHERCHE	DEBRIS	OXYGEN	SALINITY	PH	METAL	HABITAT	FLOW	THERMAL	OTHERPOL	FISHKILL	ALGAL	WEED	TURBIDIT	ODOR	FISHDECL	NOSWIM	NOFISH	OTHERSYM	IND	STP	AG	RE	SL	LD	UR	CN	HM	OT
1	1039A	CAMEL LAKE REC AREA	GOOD	THREAT						X																		X										X
23	1039	LITTLE GULLY CREEK	GOOD	THREAT						X																		X										X
26*	987	BAYOU GARCON		POOR			X					X	X										X		X						X		X		X	X		X



WITHLACOOCHEE (NORTH) RIVER BASIN
03110203

AVERAGE WATER QUALITY
1984-1993 STORET DATA
WATERSHED ID NUMBERS LINK MAP TO TABLES
* INDICATES QUALITATIVE ASSESSMENT

WATER QUALITY
GOOD
THREATENED
FAIR
POOR
UNKNOWN



WITHLACOOCHEE RIVER BASIN, NORTH

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Basic Facts

Drainage Area: 2,330 square miles (about 9% in Florida)
Major Land Uses: forest, agriculture
Population Density: low (Bellville)
Major Pollution Sources: pulp mill in Georgia
Best Water Quality Areas: Withlacoochee River
Worst Water Quality Areas: Jumping Gully Creek
Water Quality Trends: stable trend at 1 site
OFW Waterbodies: none
SWIM Waterbodies: part of Suwannee River System
Reference Reports:
Suwannee River System SWIM Plan, SRWMD, 1991
Florida Rivers Assessment, DNR/FREAC/NPS, 1989
Florida Nonpoint Source Assessment, DER (Tallahassee), 1988
Basin Water Quality Experts:
Robert Mattson, SRWMD, 904/362-1001
Homer Royals, FGFWFC, 904/357-6631

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In the News

* Reclassification of Jumping Gully Creek as a Class III Waterbody in 1991.
* Packing Corporation of America has entered into a Consent Order with DEP, which requires it to conduct research, feasibility and engineering studies to meet class III standards in Jumping Gully Creek. Studies are under review.

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Ecological Characterization

The Withlacoochee River basin originates in Georgia and terminates in the Suwannee River about 20 miles south of the Georgia-Florida border. The basin is 1,510 square miles in area and has 338 miles of river reach, but only 28 miles of river reach are located in Florida. The Withlacoochee River has a flow of 1,600 cfs before it enters the Suwannee River. The river is highly colored, but has alluvial characteristics as well. It carries more suspended sediments than most north central Florida streams. The river also receives flow from the Floridan Aquifer through several springs along its course in Florida. Blue Springs, the largest, is located about 10 miles upstream of the confluence with the Suwannee River. The major tributary of the Withlacoochee in Florida is Jumping Gully Creek near the Florida-Georgia border. The Florida portion of the basin is about half forest land and half agriculture. However, much of the upper basin, in Georgia, is in agriculture.

Anthropogenic Impacts

The River receives several point discharges before it enters Florida from a total of six domestic wastewater and four industrial wastewater point sources. The industrial dischargers are involved in plating and polishing aluminum manufacturing. In Florida, the Withlacoochee River exhibits borderline good/fair water quality depending on flow. During the rainy season, the river is characterized by higher than average sediment load for Florida rivers due to agriculture being the dominant land use in the basin. When it's dry, the relatively greater spring flow and less runoff have a beneficial effect on water quality.

Another major pollution source to the river is a paper mill located on Jumping Gully Creek that discharges about 12 MGD of high color and BOD effluent. The effluent discharges through an impoundment outfall. The Environmental Regulation Commission decided to reclassify Jumping Gully Creek as a Class III water.

** USGS HYDROLOGIC UNIT: 03110203 WITHLACOOCHEE RIVER,NORTH

SURFACE WATER QUALITY DATA FOR 1970-1993
MEDIAN VALUES FOR EACH WATERSHED
CURRENT PERIOD OF RECORD (1989-1993) USED WHERE AVAILABLE
PERIOD PRIOR TO 1989 IS EVALUATED AS HISTORICAL INFORMATION

INDEX	GOOD	FAIR	POOR
WQI-RIVER	0-44	45-59	60-90
TSI-ESTUARY	0-49	50-59	60-100
TSI-LAKE	0-59	60-69	70-100

WATERSHED ID	NAME	WATERSHED DATA RECORD MAX #OBS	BEG YR	END YR	DATA PERIOD	WATER CLARITY TURB	SD	COLOR	TSS	DISSOLVED OXYGEN DO	DOSAT	OXYGEN DEMAND BOD	COD	TOC	PH ALKALINITY PH	ALK	TROPHIC STATUS NITRO	PHOS	CHLA	COLIFORM TOTAL	FECL	BIOLOGICAL SPECIES DIVERSITY NAT	ART	BECK	COND	FLOW	WATER QUALITY INDICES WQI	TSI
* WATER BODY TYPE: LAKE																												
3	LAKE CHERRY	3	80	80	Historical	.	1.6	4	.	.	.	.	.	.	5.9	3	0.32	0.03	7	.	.	.	.	.	44	.	.	43
* WATER BODY TYPE: STREAM																												
2	WITHLACOOCHEE RIVER	168	89	93	Current	4.2	0.8	120	3	6.2	65	1.0	.	12	7.0	59	0.80	0.13	1	135	72	.	3.1	16	172	.	35	.

LEGEND:
ALK-ALKALINITY MG/L
ART-ARTIFICIAL SUBSTRATE DI
BEG YR-BEGINNING SAMPLING YEAR
BECK-BECK'S BIOTIC INDEX
BOD-BIOCHEMICAL OXYGEN DEMAND MG/L
CHLA-CHLOROPHYLL UG/L
COD-CHEMICAL OXYGEN DEMAND MG/L
COLOR-COLOR PCU
COND-CONDUCTIVITY UMHOS
DO-DISSOLVED OXYGEN MG/L
DOSAT-DO % SATURATION
END YR-ENDING YEAR
FECL-FECAL COLIFORM MPN/100ML
FLOW-FLOW CFS
MAX #OBS-MAXIMUM NUMBER OF SAMPLES
NAT-NATURAL SUBSTRATE DIVERSITY
NITRO-TOTAL NITROGEN MG/L
PH-PH STANDARD UNITS
PHOS-TOTAL PHOSPHORUS MG/L
SD-SECCHI DISC METERS
TOC-TOTAL ORGANIC CARBON MG/L
TOTAL-TOTAL COLIFORM MPN/100ML
TSI-TROPHIC STATE INDEX
TSS-TOTAL SUSPENDED SOLIDS MG/L
TURB-TURBIDITY MG/L
WQI-WATER QUALITY INDEX

SURFACE WATER QUALITY DATA SCREENING REPORT ** USGS HYDROLOGIC UNIT: 03110203 WITHLACOOCHEE RIVER,NORTH

MEDIAN VALUES FOR EACH WATERSHED SCREENED

'x'=EXCEEDS SCREENING CRITERIA
'0'=WITHIN SCREENING CRITERIA
'.'=MISSING DATA

WATERSHED ID	NAME	RANK WQI OR TSI	DATA RECORD CURRENT OR HISTORICAL	TN	STREAM TP	LAKE TP	PH	ALK	TURB & TSS	COND	OXYGEN DEMAND	DO	COLIFORM BACTI	BIOL DIV	CHLA	SECCHI DISC
				TN>2.0	TP>.46	TP>.12	PH>8.8 PH<5.2	ALK<20	TURB>16.5 TSS>18	COND>1275	BOD>3.3 COD>102 TOC>27.5	DO<4	TOT>3700 FECAL>470	DIART<1.95 DINAT<1.5 BECK<5.5	CHLA>40	SD<.7
* WATER BODY TYPE: LAKE																
3	LAKE CHERRY	GOOD	Historical	0	.	0	0	x	.	.	.	.	.	.	0	0
* WATER BODY TYPE: STREAM																
2	WITHLACOOCHEE RIVER	GOOD	Current	0	0	.	0	0	0	0	0	0	0	0	0	0

LEGEND:
ALK-ALKALINITY
BECK-BECK'S BIOTIC INDEX
BIOL DIV-BIOLOGICAL DIVERSITY
CHLA-CHLOROPHYLL
COND-CONDUCTIVITY
DO-DISSOLVED OXYGEN
CURRENT-1989 TO 1993
DIART-ARTIFICIAL SUBSTRATE DIVERSITY
DINAT-NATURAL SUBSTRATE DIVERSITY
FECAL-FECAL COLIFORM BACTERIA
HISTORICAL-1970 TO 1988
OXYGEN DEMAND-BOD,COD,TOC
PH-PH
TN-NITROGEN
TP-PHOSPHORUS
TOT-TOTAL COLIFORM BACTERIA
TSS-TOTAL SUSPENDED SOLIDS
TURB-TURBIDITY
SD-SECCHI DISC METERS
WQI OR TSI-WATER QUALITY INDEX RATING WHICH INDEX USED, WQI OR TSI, IS BASED ON WATERBODY TYPE

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SURFACE WATER QUALITY ASSESSMENT REPORT                    ** USGS HYDROLOGIC UNIT: 03110203 WITHLACOOCHEE RIVER,NORTH
     TRENDS-SOURCES-CLEANUP

     'x'=DEGRADING TREND                         |           1984 - 1993 TRENDS                 |
     '0'=STABLE TREND                            |----------------------------------------------
     '+'=IMPROVING TREND                         |     |W    T| T T C S| P A| T T| B T| D D| T F| T F |<--- PLEASE READ THESE COLUMNS VERTICALLY
     '.'=MISSING DATA                |QUALITY RANK |OVER-|Q or S| N P H D| H L| U S| O O| O O| C C| E L |
                                     |-------------| ALL |I    I|     L  |   K| R S| D C|   S| O O| M O |
WATERSHED                            |         WQI |TREND|     |     A  |    | B  |    |   A| L L| P W |
ID     NAME                          | MEETS   OR  |     |     |        |    |    |    |   T| I I|     |
                                     | USE ?   TSI |     |     |        |    |    |    |    |    |     | DEGRADATION SOURCES, PRESENT CONDITIONS AND CLEANUP EFFORTS
----- ----------------------- |-------------|     |     |        |    |    |    |    |    |     |-------------------------------------------------------------------------------

* WATER BODY TYPE: LAKE
  3   LAKE CHERRY                  |YES      GOOD|     |     |        |    |    |    |    |    |     |

* WATER BODY TYPE: STREAM
  2   WITHLACOOCHEE RIVER          |YES      GOOD|  0  |  0  | 0 + . 0| 0 x| x x| + 0| + 0| . .| + 0 |
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LEGEND:                      DOSAT-DO SATURATION           TCOLI-TOTAL COLIFORM       TURB-TURBIDITY
                             FCOLI-FECAL COLIFORM          TEMP-TEMPERATURE           TSI-TROPHIC STATE INDEX FOR LAKES AND ESTUARIES
ALK-ALKALINITY               FLOW-FLOW                     TN-NITROGEN                WQI-WATER QULAITY INDEX FOR STREAMS AND SPRINGS
BOD-BIOCHEM. OXYGEN DEMAND   MEETS USE-MEETS DESIGNATED USE TOC-T.ORGANIC CARBON
CHLA-CHLOROPHYLL             PH-PH                         TP-PHOSPHORUS
DO-DISSOLVED OXYGEN          SD-SECCHI DISC METERS         TSS-TOTAL SUSPENDED SOLIDS
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